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ABSTRACT

This handbook on teaching reading in vocational education is designed to provide vocational education teachers with a resource to use in helping students to develop sound reading skills. Provided in the handbook are information sheets, self-checks, practice activities, and suggestions for further reading dealing with the following topics: strategies for matching reading materials to student abilities (cloze procedure, fitting readability grades of text to student reading level, group informal textbook tests, and adjustments that enable students to cope with content reading); strategies for developing vocabulary and comprehension); and strategies for improving reading during content instruction (directed reading activities, study guides, and the SQ3R study formula). Appendixes to the handbook contain 22 teacher resource sheets, a reference and resource list, and answers to the self-checks. Included among the topics addressed in the individual resource sheets are introducing textbooks, words with general and technical meanings, reading symbols, directions for constructing crossword puzzles, constructing sight word exercises for content lessons, basic phonics instruction, signals for thought patterns, and reading technical materials. (MN)

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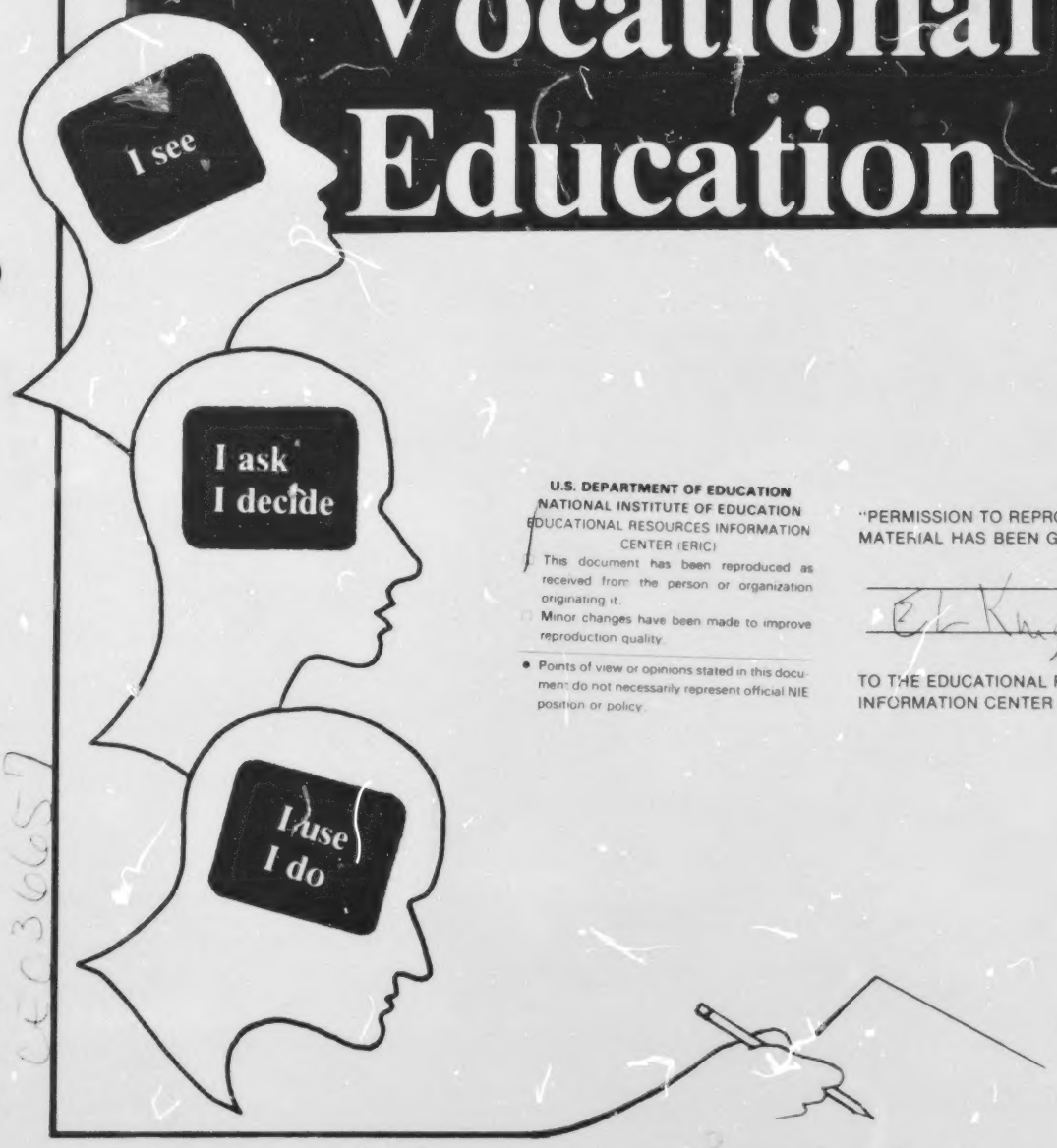

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PREFACE

Reading is the key to successful independent learning. Since vocational education courses tend to be highly individualized, heavy responsibility for independent learning falls directly on the student. If a vocational student has limited reading ability, he/she is deprived of one of the most effective ways to learn. Expressed from a different perspective: Reading becomes a necessary skill for most occupational areas.

Vocational teachers need to be aware of students' reading abilities and they need to be informed about strategies for strengthening weak reading skills. This sensitivity and knowledge on the part of the teacher will promote a climate in the classroom which enhances learning. **Teaching Reading in Vocational Education** was designed to provide vocational education teachers with a resource to use in helping students to develop sound reading skills.

Acknowledgements

A committee of South Carolina educators generously gave their time and expertise toward the development of this handbook. On behalf of all vocational educators who are striving to promote independent learning through successful reading skills, gratitude is extended to:

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INTRODUCTION

South Carolina teachers report that learning in their fields is often hampered by the inability of students to use texts and other printed materials effectively. The problem is not exclusive to South Carolina; it is not encountered solely in vocational courses; furthermore, the problem is not caused by any single reason. Blame should not be assigned to the schools alone, but rather to a combination of influences resulting from complex social and economic factors and a technology-dependent society.

The problem, however, may be more noticeable in vocational courses than in other areas because vocational teachers observe the problem not only in the context of school but also in the context of successful performance on the job.

This handbook on reading skills for vocational classes is an attempt to identify activities for developing reading skills needed by students in vocational education programs. The intention is not to make "every teacher a teacher of reading." The intention is to suggest strategies which, when incorporated into vocational instruction, enable students to make better use of printed resources.

For the convenience of the reader each reading skill is presented in regard to "what" it is, "why" it is important for vocational reading and studying, and "how" it may be included in content instruction. Frequently examples of ways to teach those skills are included either in the text or in an appendix.

At intervals through the handbook the teacher will find a group of questions labeled Self-Check. This feature is intended to give immediate feedback and reinforcement. Practice Activities are also suggested. These, it is hoped, focus on one of the many suggestions, so that the reader is encouraged to try a little at a time and be stimulated, not exhausted.

Further Reading related to each topic that is presented is also included at intervals. In most instances there will be a reference to **Teaching Reading in South Carolina Secondary Schools**, Susan J. Smith, Editor. There are several reasons for calling attention to this work. First, it is available in most secondary schools, for it has been distributed to all local school districts. Second, it is much more comprehensive than this handbook. Third, it was developed by teachers who know South Carolina students. Finally, but most important, it is a credible and worthwhile example of a reading resource book.

In connection with the teaching of reading there are four tasks which every teacher should be able to do, no matter what the teaching area. The teacher must be able to:

1. Identify the reading skills needed for the subject, the unit, and the particular assignment.

2. Determine the student's level of preparedness (or lack of it) in the needed reading skills.

3. Include activities for developing or reinforcing reading skills as part of the regular teaching strategy.

4. Stimulate recreational, or voluntary, reading in connection with the specific content area.

This handbook deals with these four identified aspects of using printed media to assist learning, but in somewhat different order. Part I is devoted to the subject of fitting learning materials to the student. A part of fitting the materials to the student involves finding the student's general reading level. More essentially, it involves learning whether or not the pupil has the specific skills, background information, and interests that are necessary for effective study. Fitting materials to the student also involves analysis of the material to be studied-the general level of reading difficulty and the specific skills required. In addition to knowing student ability and material demands, the teacher will want to create an environment in which high-interest printed materials related to the subject help build background and motivation for learning. Consideration of these topics should help the teacher match instructional materials to student reading ability. Thus, Part I of the handbook encompasses Tasks 2 and 4 as cited in the preceding paragraph.

Part II of the handbook deals with certain reading skills which are needed when using subject matter materials. Here the curriculum writing committee has arbitrarily, but reasonably, it is hoped, limited the treatment to skills of vocabulary and comprehension that are needed in the classroom and on the job. Since knowledge of word meaning is the greatest single contributor to comprehension, and therefore to successful study, there is a section on vocabulary, including ways to develop and reinforce the meaning and recognition of words necessary for effective learning.

The treatment of reading comprehension emphasizes literal comprehension skills. For vocational students the ability to follow directions exactly as stated is an essential need. Closely related to this need is the ability to recognize and remember the main idea of printed material. Students must also be able to identify and remember important details of the assigned passages. Finally, learning to recognize thought patterns such as sequence, cause and effect, etc., assists the students in mastering text information and in performing on the job.

Emphasis on literal comprehension skills has been mentioned. These skills serve as the foundation for higher level comprehension. More complex skills which the vocational student needs both in school and on the job include the skills of recognizing situations in which a set of procedures are applicable, reading critically to determine the comparative worth of equipment and materials, and using printed materials to identify and solve problems.

Familiarity with the information and suggestions dealing with vocabulary and comprehension skills should help the instructor know which particular skills the student will need for using a given piece of material. Thus, Part II of the handbook focuses on Task 1 as previously cited.

Part III of the handbook presents teaching strategies and plans (Task 2 as previously cited). Among the strategies are the steps comprising a directd reading assignment, construction of study guides, and use of SQ3R study procedure. The plans which are suggested draw upon the skills information discussed in the preceding sections and show how development of those skills can be an integral part of any lesson.

All three parts cover the most essential elements of "what every teacher should know about reading"-what skills the student needs for the subject, how to assess those skills, how to integrate instruction on the skills in the lesson, and how to promote voluntary reading in relation to the subject.

Following the sections on reading-learning skills and strategies is Part IV, Appendices. Sample materials for using the text suggestions in a given vocational subject are found in Appendix I. Unfortunately, representation from all vocational fields has been impossible. Some vocational instructors examining this handbook may feel that too large a proportion of the examples come from home economics related areas. The feeling will have a basis in fact; however, several reasons exist for that field being represented more frequently than others. One principle cited throughout the handbook is that comprehension depends on the background experience of the reader. Among the readers of the handbook, many will not have experience in pulpwood harvesting, or office machines, or tilesetting, but all will have experience related to food, shelter, family living, and meeting expenses of existence. Sometimes the choice of illustration, of necessity, has been strongly influenced by the fact that, "It was there." The committee anticipates that time will add, "It was useful." The authors hope that this section will grow as teachers construct their own activities and share with their colleagues. With that in view the handbook has been punched so that it may be placed in a three-ring binder.

Appendix II lists sources for additional information on reading skills for vocational students. Appendix III gives the answer key for the Self-Check questions that have interspersed throughout the discussions.

If the instructor can explore a very limited number of the teaching suggestions, stimulating activities to reinforce word meaning and continuous attention to recreational or voluntary reading materials related to the subject field are probably the best choices.

A note on how to present the suggested activities is in order. Students enrolled in vocational subjects already have received years of instruction in reading. Some students have achieved well, many poorly, and some hardly at all. All, however, can be guided to use printed materials as an aid to learning content if appropriate practice activities are incorporated in the content lessons. Usually a little instruction in connection with, for example, a lesson on maintaining pastures is more effective than much more instruction in a remedial reading class would be. Presenting needed skills as study procedures to use in a given vocational unit will be apt to accomplish much more than identifying the practices as a means of improving reading. On the other hand, demonstrating to the student who perceives his/herself as a poor reader that he/she can use printed text to learn provides a powerful motivating force.

While the major purpose of this handbook is to serve as a reference which the individual teacher may use regularly, its usefulness could be greatly enhanced if it were a basis for inservice discussions. In an inservice situation a small group of teachers in related fields would select one subject skill which seemed to them of possible usefulness. They would discuss the skill as presented in the text, and each would prepare a plan for incorporating aid on the skill in a future lesson. Members would review the plans, making suggestions if need be. At a subsequent meeting members would report the reaction of students to the instruction, suggest ways to improve the activities, and exchange copies of materials that others could use.

Whether the handbook is used by individuals or by groups, its ultimate value will depend on the instructor's choosing a skill that seems promising for present students, including instruction on that skill in the regular lesson, and continuing to include emphasis on the skill until the students can and do use it to learn the primary subject. Vocational instructors are in a position to offer significant reinforcement in the basic skills!

PART I: STRATEGIES FOR MATCHING READING MATERIALS TO STUDENT ABILITIES

INTRODUCTION (PART I)

Matching the reading demands of instructional materials to the reading abilities of the students involves assessment and adjustment. At what level can the student read? To what extent is the student prepared to use the skills which are required most frequently in a particular content? For example, students in typing must have skill in proofreading, while those in automotive mechanics must know how to interpret diagrams. This kind of assessment applies to the student's ability.

Next, the material must be assessed. What is its level of difficulty? What skills are most needed? This kind of assessment applies to characteristics of the material.

Finally, adjustments must be planned. Students whose general level of reading falls below the level of the material must be given detailed preparation and guidance; they may need an audio tape of the text so they can listen as they read. Even those students who generally read comparatively well must have special skills reinforced. The high school literature teacher is an excellent reader. Yet she finds she lacks essential vocabulary when she tries to help her grandson study the football handout on gaps. These adjustments apply to increasing students' readiness to learn.

Ideally, the greater part of adjustment is done through manipulation of instructional material. If the text is too difficult, the instructor may choose one that presents the same information at an easier reading level. Often this option is impossible for conveying the main content, but some supplementary materials related to the subject can be found.

Another means of adjusting the material is to rewrite it in an easier form. At first encounter, this alternative seems impossibly burdensome, but it can be dealt with a little at a time in the form of handouts or as notes for the student to copy.

An adjustment of material that is somewhat like rewriting, (possibly slower, but probably more effective) is the use of what reading teachers call the language experience approach. For this procedure the instructor presents the content to be learned by any combination of means such as reading, showing, or telling. Members of the class then dictate what they remember for someone to record on the chalkboard or a transparency. Eventually, after the class organizes and edits the materials, each student is provided a copy to use as the text or the prime supplement for the text.

The rest of this section will discuss in detail some of the assessment and adjustment procedures which have been mentioned.

CLOZE PROCEDURE

What?

Cloze procedure offers a direct and economical means of assessing the student's ability to benefit from studying a given text. The student is given a representative passage from the text and asked to supply words that have been systematically deleted. Depending on the proportion of words supplied that are exactly like the author's, the text may be classified as at the student's "independent," "instructional," or "frustration" reading level.

Independent level means that the student can read the text without assistance, encountering few word difficulties, and achieving almost complete understanding. Instructional level means that the student can read the text with some instructor guidance. Frustration level means that the student is unlikely to profit from study of the text even when help is provided-just too many difficulties are present.

Why?

Research has demonstrated that cloze procedure does provide a measure of the suitability of a particular piece of material to a particular student's ability. It effectively answers the questions: Can the student benefit from the text? With or without aid? It takes into account the student's interest in the material read and whether the student has the necessary background of information.

To prepare a cloze test for a book, a 250-word passage which seems typical of the book is chosen. The passage is copied leaving out every fifth word. The blanks are all made the same size, for example, fifteen spaces. Some writers advise leaving the first and last sentences of the selection intact. On duplicated copies, students are asked to supply for the blanks the words they think the author used. There are no time limits for this work. It is important to emphasize to the students that this procedure is a way of determining how appropriate the text is for them, not a way of judging or grading the student.

How?

For scoring, every word supplied that is identical to that which the author used is considered correct. (Spelling errors are overlooked.) For students supplying about 44% correct words, the material is said to be at instructional level. For those supplying about 60% words identical, the passage is said to be at their independent level. For those scoring below 44%, the material is said to be too difficult. If easier material is available, it should be used, or extensive adjustment by the instructor should be planned. For vocational subjects, alternate material is often not available.

The criteria for judging the results of a cloze exercise vary with different investigators and in different studies by the same investigator. Consequently the instructor should feel confident about using some individual judgment in interpreting the results of a cloze exercise. For instance, the student

completed 34% of the blanks correctly. Synonyms are not counted as correct, but this student had among the misses eight excellent synonyms. The instructor may decide the student is capable of using the material successfully with a moderate amount of guidance. Reminders of the variation in criteria for assessing the student's ability to use the material are found in Figure 1.

Figure 1

Result of Cloze Test for _____

Date _____

Student	Too Difficult Less than 44%	Appropriate 44% (37% - 45%)	Easy 60% (57% - 62%)

Suggestion: Instructors may want to give students practice exercises (short samples) before actually using the cloze test in order to preclude any frustration on the part of the students. Frustration could prevent the instructors from getting an accurate measure.

EXAMPLE: Define hair and describe the function, location, composition, and types of hair.

Dalton, **The Professional Cosmetologist**, pp. 38-39

The two functions _____(1) the hair are cosmetic _____(2) protective. Hair adorns the _____(3) to improve the appearance _____(4) the individual. On certain _____(5) of the body it _____(6) the skin from friction.

_____(7) many animals are protected _____(8) and over larger areas _____(9) their bodies than humans, _____(10) also have hair over _____(11) parts of our bodies, _____(12) for _____(13) palms of the hands, soles of the _____(14), the lips, and a _____(15) other very small areas. _____(16) human hair is not _____(17) to see, except on _____(18), scalp, face, arms, and _____(19).

There are two basic _____(20) of hair: lanugo (lan-OO-goh) (vellus) _____(21) and terminal hairs. Lanugo (_____(22)) hairs are all over _____(23) body. They are fine _____(24) lightly pigmented (colored). Terminal _____(25) are coarser, thicker, and _____(26) pigmented (colored). Terminal hairs _____(27) found on the scalp, _____(28), and externalities.

It is _____(29) to make general statements _____(30) hair because on different _____(31) on the body it _____(32) in length, strength, and _____(33) of growth. Hair is _____(34) into six types: (1) scalp, (2) _____(35) and eyelash, (3) beard, (4) body, (5) _____(36), and (6) underarm (axillary).

The _____(37) names for hair involved _____(38) salon services are: (1) capilli (_____(39)) (scalp hair), (2) supercillia (soo-per-SIL-ee-ah) (_____(40)) and cilia (eyelashes), _____(41) (3) barba (beard).

Scalp hair provides a _____(42) that helps the skull _____(43) the brain. The eyebrows _____(44) eyelashes shield the delicate _____(45) of the eyes (for _____(46), from a speck of _____(47) or dust). Beard hair _____(48) the face. Both men ____(49) women have beard hair, ____(50) male hormones make men's beard hair much coarser than women's.

ANSWERS

1.	of	14.	feet	27.	are	40.	eyebrows
2.	and	15.	few	28.	face	41.	and
3.	body	16.	But	29.	difficult	42.	cushion
4.	of	17.	easy	30.	about	43.	protect
5.	parts	18.	the	31.	parts	44.	and
6.	protects	19.	legs	32.	varies	45.	tissues
7.	Although	20.	types	33.	rate	46.	instance
8.	better	21.	hairs	34.	grouped	47.	dirt
9.	of	22.	(vellus)	35.	eyebrow	48.	protects
10.	we	23.	the	36.	pubic	49.	and
11.	most	24.	and	37.	technical	50.	but
12.	except	25.	hairs	38.	in		
13.	the	26.	more	39.	(cah-PIL-igh)		

Score: Number correct____ x 2 = _____%

Self-Check on Cloze Procedure

Mark the following items true or false.

_____ 1. Cloze tests require the student to fill in the blanks.

_____ 2. Cloze tests tell the student's reading grade equivalent.

_____ 3. Cloze tests tell the difficulty grade of the text.

_____ 4. Cloze tests tell whether the material is appropriate for the student.

_____ 5. Cloze tests let the teacher know how much help the student will need when using the text.

_____ 6. Cloze tests are difficult to construct.

_____ 7. Cloze tests require extensive training for interpretation.

Score: Number right ___ - number wrong = _____

Practice Activity

Prepare a cloze test for pupils you already know, using part of a current text which has not yet been studied. Compare the classifications you obtain with what you have already observed about the student's abilities. When you find discrepancies, try to think of a reason for the differences before you decide your opinion is wrong or that the cloze results are poor. For example, one instructor realized that a student who was doing well in the subject but appeared to have an inferior reading ability had learned to compensate. The student listened attentively in class and often made an excuse to stay afterwards to ask questions about the subject of the lesson. On tests the student asked to have questions explained; this request really meant that he/she needed to have the questions read to him/her.

Further Reading

Estes, T. H. **Cloze Procedure**, pp. 29-32.

Johns, J. L. **Using Cloze Readability Procedure**, pp. 155-157.

FITTING READABILITY GRADES OF TEXTS TO STUDENTS' READING TEST GRADES

The most obvious means of matching the difficulty of the text to the student's reading ability would at first seem to be to measure the student and then to measure the materials until appropriate material is found.

Reading Grades Scores

Most school records contain a reading equivalent score from a standardized achievement test battery for each student. A score such as 8.4 is usually read as eighth grade, fourth month. It means that the student selected, on a multiple choice test, the same number of correct choices as the average student in the fourth month of the eighth grade selected on that test. It does not mean that the student could regularly read material of grade 8.4 difficulty. Often, because of the error contained in any score, the test manual will indicate that for an individual the grade equivalent score means that two thirds of the time the student's "true" score would fall between grades 7.4 and 9.3. In practice, it is wise for the instructor to view grade equivalent scores as measures that represent frustration level reading for the student. What?

With such a description, the question arises: Why use these scores at all? A part of the answer is: They are at least one measure of the student's general reading level, and they are available. Using grade equivalent scores to aid in choosing texts certainly comes closer to ensuring a good match than acting on the assumption that all students assigned to the tenth grade have tenth grade reading ability and are ready for texts identified by publishers as tenth grade texts. Why?

When instructional materials must be selected, a rough but useful guide for estimating the student's instructional level is to subtract one grade from the grade equivalent score. The instructor should subtract two grades from the score to estimate the student's independent reading level. Ideally, content texts should be at the student's independent reading level so that the only difficulty met in studying is the subject matter itself. In a situation in which adequate numbers of texts of varying reading difficulty are available on a subject but a single text is desired, the text fitted to the less able members of the group should be chosen. It is more feasible to offer enrichment study to the abler students than to strive to give sufficient aid to the weaker ones who are seeking to master basic knowledge using a text they find too difficult. How?

Readability Measures

There are presently a hundred or more formulas for measuring the readability of written English. They vary in precision. Even the most elaborate computerized method cannot be exact, for readers vary in ways that cannot be measured. Interest in the What?

subject, need for the information, and background of knowledge and experience play a large part in determining the difficulty of a passage to a reader.

Most readability measures are based on word difficulty and sentence difficulty. Often, as in the Fry and Flesch formulas, the number of syllables in a word is used to show how difficult the word is. On the average, number of syllables is a reasonably good indicator of word difficulty. Today's high school student, however, usually finds qualm harder than elevator. For any single word, its familiarity and its degree of abstractness are better indicators of ease or difficulty.

Raygor has found that any word which has more than five letters may be considered a difficult word. Counting the words with more than five letters can be done more quickly than counting the syllables in a passage.

The highly respected Dale-Chall, Harris-Jacobson, and Spache formulas use lists of words which have been identified as easy as the guide to word difficulty. All the words in a passage which do not appear on the specified list are considered to be difficult words. Since the lists of easy words have been carefully chosen, this method constitutes a more precise way of identifying difficult words. In practice, however, the precision gained is small, and the labor of counting words that are not on a list is great.

All of the formulas mentioned above use sentence length as the indicator of sentence difficulty. Like length of word, length of sentence is an on-the-average measure. "To be or not to be: That is the question," considered either as a single nine-word sentence or as two four and five-word sentences is obviously much more difficult to understand than, "This month Tom Brokaw and Roger Mudd have replaced John Chancellor on the NBC evening news," a sixteen-word sentence.

As measuring instruments, the accuracy of readability formulas is not perfectly defined. Nevertheless, they do provide a way to estimate the difficulty of reading material which is superior to the individual opinions of all but the most experienced teachers. While there may be some disagreement about the grade rating a formula assigns to a piece of material, the comparative ratings of materials measured by the same formula are quite dependable. If three texts on child care were measured, experienced instructors might not agree that they were respectively seventh, eighth, and ninth grade reading level. Yet the probability is great that the instructors would rank the texts in the order of "easiest," "next harder," and "hardest to read." Why?

Another reason for measuring the text with one or more formulas is to check on the publisher's claims regarding the students for whom the text is designed. Sometimes there is wide disparity between the publisher's claim of readability level and

the level obtained from direct measurement. The difference is usually toward greater difficulty than the publisher's description has indicated.

To select a readability formula the teacher should:

1. Select three or more representative passages (usually 100 words) of a text that he/she has used in teaching.

2. Measure each passage with each of the formulas being considered.

3. Note whether the results of measuring a) agree with each other, b) agree with personal opinion regarding the level of the material, and c) seem, from personal experience, to be estimates of instructional or independent grade.

4. Select one of the formulas on the basis of observations made in Step 3 and on the basis of convenience in application. For instance, a formula may be the quicker to apply, but may indicate the material is easier than experience using the material has shown. In this case the teacher could use the convenient formula and treat the material as being a grade or half a grade more difficult.

5. Choose a formula and apply it to samples of unfamiliar material using the insights gained in Steps 1-4 to guide the interpretation of its results. The teacher's cumulative experience with a given formula will make that one more useful in practice than an unfamiliar formula which is technically superior.

EXAMPLE

Here the Fry and Raygor formulas are applied to a passage from a text for an introductory course in industrial drafting. Most students enrolled in this course are in the eleventh or twelfth grade.

William P. Spence, "Making Pictorial Drawings," **Basic Industrial Drafting**, p. 139

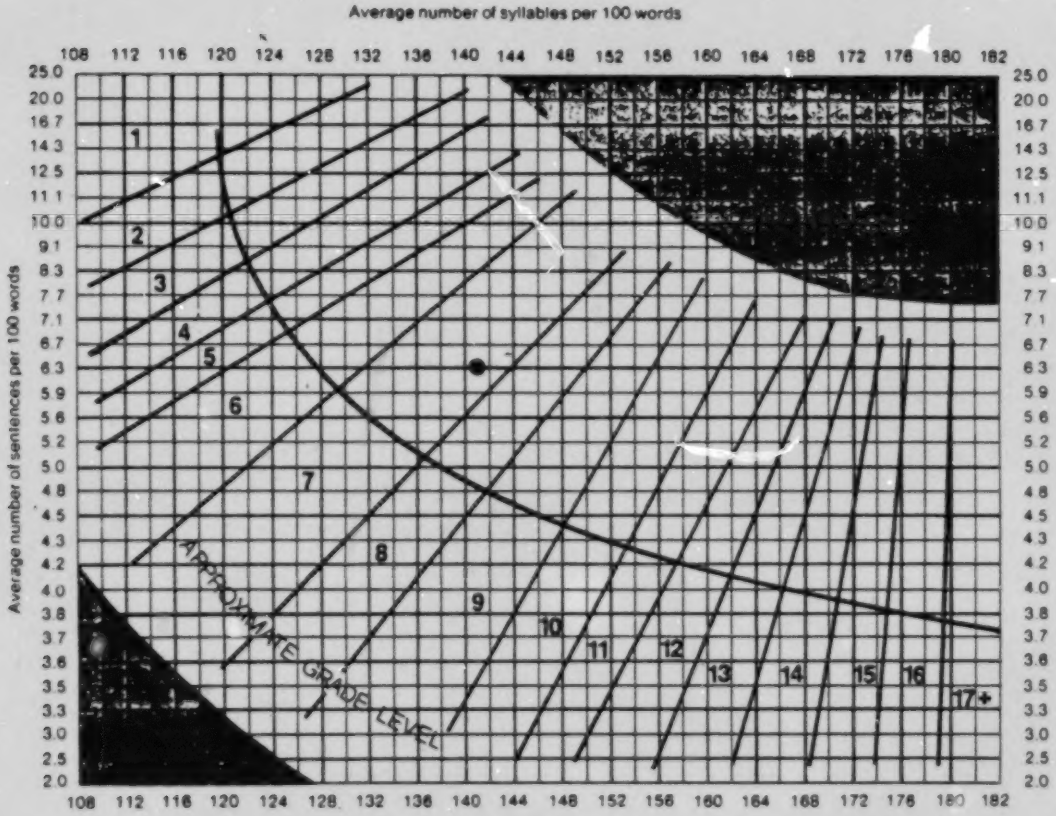
| Syllables in addition to the first | | |

Using the Fry graph (Figure 2), the location for 9 sentences per hundred words and 171 syllables falls just inside the invalid area. This point would appear between projections of lines which represent twelfth grade difficulty. Using the Raygor graph (Figure 3) results are similar-invalid in the projected eleventh grade area. In both cases the location for this passage comes at a relatively easy point on the sentence-length scale and a difficult point on the word-difficulty scale.

Figure 2

GRAPH FOR ESTIMATING READABILITY — EXTENDED

by Edward Fry, Rutgers University Reading Center, New Brunswick, N.J. 08904

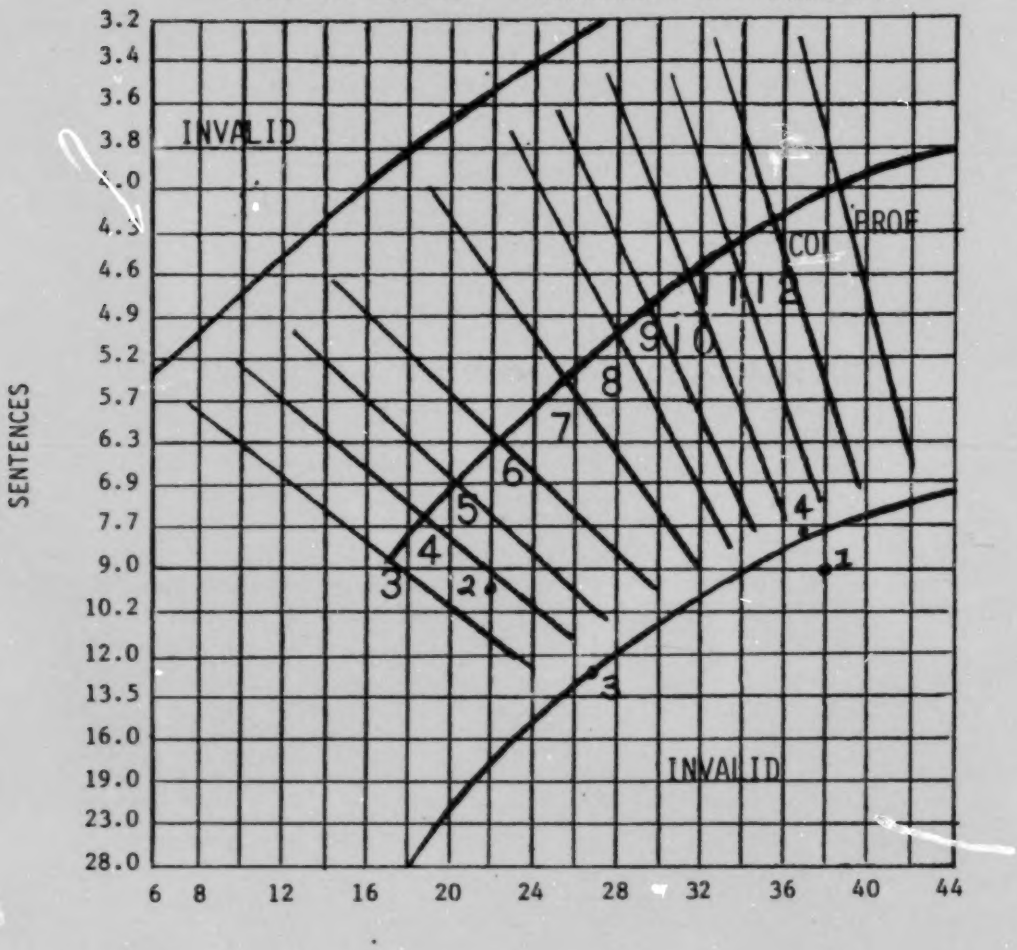


2.1

Figure 3

THE RAYGOR READABILITY ESTIMATE

ALTON L. RAYGOR - UNIVERSITY OF MINNESOTA



Expanded Directions for Working Readability Graph

1. Randomly select three (3) sample passages and count out exactly 100 words each, beginning with the beginning of a sentence. Do count proper nouns, initializations, and numerals.
2. Count the number of sentences in the hundred words, estimating length of the fraction of the last sentence to the nearest one-tenth.
3. Count the total number of syllables in the 100-word passage. If you don't have a hand counter available, an easy way is to simply put a mark above every syllable over one in each word, then when you get to the end of the passage, count the number of marks and add 100. Small calculators can also be used as counters by pushing numeral 1, then push the + sign for each word or syllable when counting.
4. Enter graph with **average** sentence length and **average** number of syllables; plot dot where the two lines intersect. Area where dot is plotted will give you the approximate grade level.

5. If a great deal of variability is found in syllable count or sentence count putting more samples into the average is desirable.
6. A word is defined as a group of symbols with a space on either side; thus, **Joe**, **IRA**, **1945**, and **&** are each one word.
7. A syllable is defined as a phonetic syllable. Generally, there are as many syllables as vowel sounds. For example, **stopped** is one syllable and **wanted** is two syllables. When counting syllables for numerals and initializations, count one syllable for each symbol. For example, **1945** is four syllables, **IRA** is three syllables, and **&** is one syllable.

Long Words

Directions:

Count out three 100-word passages at the beginning, middle, and end of a selection or book. Count proper nouns, but not numerals.

1. Count sentences in each passage, estimating to nearest tenth.
2. Count words with more than five letters.
3. Average the sentence length and word length over the three samples and plot the average on the graph.

Example:

	Sentences	5+ Words
A	6.0	15
B	6.8	19
C	6.4	17
Total	19.2	51
Average	6.4	17

Note mark on graph. Grade level is about 5.

By measuring additional passages, greater understanding of the readability formulas and of the characteristics of the text can be obtained. Figure 4 shows the results of four passages.

Figure 4

Comparison of Ratings by Two Readability Measures

		Words	Syllables	Long Words	Rating
1.	Fry	100	171	38	invalid, grade 12
p. 139	Raygor	100	171	38	invalid, grade 11
2.	Fry	100	131	22	grade 4
p. 53	Raygor	100	131	22	grade 4
3.	Fry	100	143	27	grade 5
p. 160	Raygor	100	143	27	grade 4
4.	Fry	100	175	37	invalid, grade 14
p. 164	Raygor	100	175	37	grade 11

The directions with both formulas include averaging the passage ratings for an estimate of the whole book, but study of Figure 4 yields more useful information for the teacher. Although the ratings are similar, three out of four times the Fry method rates the material at a higher grade level than does the Raygor. Since this set of measures is applied to a familiar text, the teacher's experience will determine which formula gives the truer estimate. If the Fry ratings seem more accurate, but the Raygor measure is quicker, the teacher can use the Raygor making the adjustments suggested in Step 4 of how to select a readability formula.

With both formulas, passages 1,3, and 4 fall in or near the invalid range on the graphs because of word difficulty-syllables or length. This condition warns the teacher using the text that "trouble-shooting" in the form of preteaching some vocabulary will be needed to insure student success.

The consistent pattern of moderate difficulty in sentences supports the author's statement, "The reading level was considered important and was carefully checked as the book was written." In the samples where word difficulty was not great, the reading measures registered around grade four or five. In the other samples, words such as pictorial, perspective, isometric, electricity, and electronic were essential to the topic being studied. The text, then, probably has as easy a reading level as the subject permits.

Next, the instructor looks over the standardized reading scores of the students who will be using the text. Following the interpretation suggested under "grade scores," the instructor sees that, although the scores seem low for eleventh grade students, only a few students' scores fall below grade 6.0.

Subtracting two grades to estimate the independent reading level of the least able readers,it is clear that the text measured is an appropriate text for the group. As far as demands of content vocabulary permit, it fits two important principles:

1. Text should match the ability of the less able students whenever possible.
2. Content texts should, in the main, match the independent reading level of the student.

Self-Check on Students' Test Grades and Readability Grades

1. If reading grade equivalent scores are used, the student's instructional reading level should be estimated as _____.

2. If reading grade equivalent scores are used, the student's independent level should be estimated as _____.

3-4. Most readability measures are based on difficulty of _____ and difficulty of _____.

5. Often a publisher's description of the readability of texts is _____ than teachers' opinions of how difficult the text is.

6. Sometimes the nature of the subject to be learned makes it almost impossible to control one of the factors which formulas measure. Which one?

Practice Activities

1. Inspect the standardized test reading grade scores of one of your classes. Ignore the two lowest scores. Using the median (centerpoint) of the next three scores, estimate the independent level, which would be a desirable level of readability for your text.

2. Apply the Fry and the Raygor readability graphs (Figures 2 and 3) to measure at least one sample from a text you are now using.

Further Reading

Estes. **Analyzing Reading Material**, pp. 22-34.

GROUP INFORMAL TEXTBOOK TESTS

What?

The group informal textbook test is another procedure for fitting instruction to student ability. For this type of test the teacher selects a passage from the text which will be used. Items of the test are designed to check the understanding that the student should obtain from that particular selection. They also sample the reading skills the student would need.

Why?

The advantage of this test is that it samples the actual behavior that will be needed in the course. Every subject has its own specialized vocabulary. Every subject has some skills which are needed frequently. Many students, because of the relevance of vocational subjects, show an ability to understand which is different from their comprehension on general reading tests. Analysis of the students' performance on the textbook test enables the instructor to identify which skills are needed both by the group and by individuals. In turn, this information assists in plans for instruction.

Construction

How?

1. Select a passage from the text which represents a single topic. Comprehension should not depend heavily on preceding material. The length should be approximately three or four pages.

2. List the general and specific skills, usually eight to ten, which will be needed to master the content. Lists will vary, but all will include ability to use different parts of the book, general vocabulary, vocabulary in context, ability to identify main ideas and important details, and ability to recognize some relationships.

   The teacher should plan about twenty-five to thirty questions in all. For each skill on the list there should be at least three items.

3. If the ability to skim or scan is important in the subject, prepare a separate passage to test that skill.

4. Identify the questions which will require use of the text and put them first on the test or on a separate sheet from the other questions.

5. Have the questions duplicated. Some authorities (Shepard, 1982, p. 155) advise reading the question to the class.

Administration

1. Explain to the class the purpose of the test. "This is a test on which you should do your best. You will not, however, receive a grade on it. It will show me what kind of help members of the class will need in learning the course." It is appropriate, but not necessary, to identify what skill each group of questions is checking.

2. Introduce the topic and provide some background for it just as you would do in a regular class session.

3. Have the students answer the more general questions, study the passage, and then answer the questions on the passage. At this point procedures will vary. Instructors who wish to have the questions answered from memory will have the passage read and the text. Some instructors may be of the opinion that it is more important to know whether the student comprehends, with or without the text, than to know whether the student remembers on first reading. For them there will be no need to separate the test in two parts.

   Instructors who prefer to read the questions to the class, obviously will have no need to separate the questions.

4. Note the order in which the students complete work. This information, along with the overall results will help identify the efficient students, the cautious, the careless, and the plodders.

5. Prepare a chart for analyzing the student's performance on each skill and a cumulative chart for the class.

6. Prepare scoring key. Using good multiple-choice questions increases the work of test construction, but reduces the time for scoring. Items do not have to be all in the same form. Opinions on whether students or teacher should do the scoring vary.

Interpretation and Use of Test Scores

1. Performance on each skill tested is more important than overall score. Overall performance below 65% indicates an easier text would be desirable or extensive study support should be provided. Students having total scores above 90% probably could handle a more difficult text or could work independently.

2. For each category of questions which had three or four items, more than one wrong answer indicates deficiency. For groups with five to eight items, more than two

errors indicates deficiency. Grading should be strict because students are not being judged. "Giving the benefit of the doubt" leads to withholding help that may be vitally needed.

3. Identify groups of students who need help with each skill.

4. Discuss the results of the tests with the students. Some of them will be helped by merely having attention called to the kind of skill they failed to use.

5. Use the information via planning activities to strengthen the skills needed by the whole group, by small groups, and by individuals as part of regular content lessons.

Self-Check on Group Informal Textbook Tests

1. In planning this kind of test for a passage the teacher's first task is:

   a) To choose among true or false, short answer, or multiple choice format.

   b) To analyze the reading skills needed to understand the chosen content.

   c) To be sure the passage has a readability rating which fits the average reading grade of the students.

   d) To see if the authors have provided study questions at the end of each chapter.

2. The most valuable information the teacher obtains is:

   a) Knowing which important skills are needed by each pupil.

   b) Knowing which pupils need an easier text.

   c) Knowing which students can be trusted to grade their own work.

   d) Knowing which students work fast-correctly, fast-with poor results, slowly-with good results, slowly-with poor results.

3. The results of the group informal textbook test are used for:

   a) Demonstrating teacher accountability.

   b) Assigning special rewards to the students who do well.

   c) Referrals to the remedial teacher.

   d) Planning ways to assure successful learning experiences.

Practice Activity

Choose a section of a text you teach (not more than three pages) and identify the following that could be test items.

1. One word - general vocabulary
2. One word - explained in context
3. One important detail
4. One main idea
5. One implied idea (not stated but easily derived)

Discuss your choices with a friend.

Further Reading

Readance. "The Content Reading Inventory," **Content Area Reading: An Integrated Approach**, pp. 89-94.

Smith, S. J. "Informal Measure of Study Skills," p. 15
"Class Chart-Informal Inventory," p. 83

ADJUSTMENTS WHICH ENABLE STUDENTS TO COPE WITH CONTENT READING

Training in Using Textual Aids

One activity which should be used with all students to promote successful study is detailed introduction of the text. Many able students and many more of the poorer students are unskilled in using aids that are provided by the textbook. A guide for introducing a text (Readance, 1981, pp. 65-69) will be found in Appendix I-A. An enjoyable activity for reinforcing students' study of the parts of the text is a teacher-constructed scavenger hunt in which the scavenged items are collected through knowing how to use the text.

Prereading Activities

Students who, according to the assessment procedures already examined, appear to have somewhat inadequate reading ability often can have successful study. This situation occurs because the instructor gives extensive preparation for the reading assignment. Prereading activities such as building background, teaching key vocabulary and concepts, and setting purposes are discussed below. In a sense, by creating readiness for the task the instructor "adjusts" the students' level of ability to do that particular assignment.

Rewriting the Text

For students whose assessment scores indicate serious inadequacy, the instructor may choose to rewrite the text. Linda Bryant (Refer to Reference Resource List) has prepared a guide applicable to any content (Figure 5).

Figure 5

Rewriting Content-Area Material

Deciding to Rewrite. When a teacher must use a textbook which is above the reading level of several members of the class, rewriting the material in order to lower the level of difficulty is a good alternative. The task is time-consuming, but it can be very rewarding in terms of increased student learning. One possibility for reducing the time required is to have several teachers using the same textbook to cooperate in rewriting different sections and then share their rewritten passages.

Getting Ready to Rewrite. The first step in rewriting is to select the major concepts and terms which are to be retained from the original text. List the major concepts in complete sentences, and list the words which must be kept from the original. These are the content-specific terms which are integral to the lesson.

Rewriting. In rewriting, it is necessary to keep in mind all factors which affect difficulty level. Here are some general guidelines to follow:

1. Use shorter sentences, but avoid being too choppy.
2. Avoid passive voice whenever possible.
3. Avoid using many dependent clauses and participial phrases.
4. Avoid sentences in which the major elements are not in normal order. Use the regular patterns such as subject-verb / subject-verb-object / subject-verb-indirect object-object. You may use questions.
5. Use interesting, colorful, informal language, if possible.
6. Provide context clues for different words.
7. Provide examples or explanations of difficult concepts.
8. Provide illustrations, maps, charts.
9. Plan the type page to be appealing.
10. Plan for effective organization, using good transitions between paragraphs and sections. Use headings.
11. Add marginal notes, if desired.

Revising. After the first draft is written, compute the approximate readability level with the Fry formula. If the level is still higher than desired, revise the passage, shortening either sentences and/or words. Use student feedback concerning difficult sentences or concepts to guide further revisions.

Language Experience Materials

Among reading teachers the term language experience describes stories which the student writes or dictates. These stories, composed in the student's own language and telling of events the student understands, are, therefore, easy for the pupil to learn to read. A number of variations of this process can be used when having the students "write their own text." These manageable materials enable the students to master the essential content. Often students are able to make some use of the regular text after practicing with their own version.

What?

Why?

Steps for Making a Language Experience Text

How?

1. The instructor demonstrates a process, shows film or slides, shows pictures, tells information, or reads the text.

2. Students then describe what has happened or what they have seen or heard. At this point all comments are accepted and recorded on chalkboard or overhead by the instructor.

3. Students discuss the statements and eliminate those which are inaccurate.

4. Students decide on organization of the information and instructor reorders the statements, preserving the orginal language as much as possible.

5. Throughout the process students read together what is being recorded.

6. Students either copy the account or the instructor has it duplicated.

7. Students practice reading the material silently and sometimes orally.

8. Instructor aids the class to cross-reference material with the regular text so that illustrations, maps, and charts can be used with the class version. Spelling of technical words can be checked and cross-referenced to the class material.

Reading and Listening

Students who are non-readers or very poor readers often benefit from following the text as they listen to a tape of the instructor reading. This procedure makes certain that the student has been exposed to the content. It does not make certain that the student was becoming acquainted with the text. Instructors may increase attention to text by interspersing directions such as "Stop the tape and copy the names of the three tools you will need," or "On the graph find the year of highest corn production."

Students listening individually have the advantage of being able to stop and start the tape in order to reread or listen again. They may achieve more reading improvement. On the other hand, students listening in groups help each other and so have the advantage of practicing the language of the topic. In either case, study guides will enhance learning for those who read and listen.

Self-Check on Adjustments Which Enable Students to Cope with Content Reading

1. How can the teacher help students who are mildly deficient in content reading ability?

2. Name three ways to make content reading easy enough for students who are seriously deficient in reading.

Practice Activity

At the first opportunity, teach one topic as a language experience activity or rewrite one difficult subtopic and try the material with some students.

Further Reading

Smith, S. J. **Language Experience with Secondary Students**, p. 85.

Shepherd. **Rewriting**, 1982, p. 51.

Promoting Voluntary Reading in Vocational Classes

There is no doubt that recreational reading related to a vocational subject helps build background information, reading skill, and motivation. Only a few suggestions and reminders are offered here because many materials and activities are pertinent only as they relate to a particular area.

Do's for Teachers

1. Surround students with the opportunity to read-charts, bulletin boards, and written directions.

2. Have classroom, shop, or laboratory reading collection. Scrounge and, if necessary, have students bring items to lend to the collection.

3. Read brief items from newspaper and periodicals aloud to class.

4. Have students see you reading for your own satisfaction.

Materials Easily Acquired

Newspapers-something for every subject, if only classified

General periodicals-staple articles that are especially pertinent in folders

Trade journals

Government bulletins

Product containers-a rich source for critical reading

Directions for assembling toys, household, and recreational equipment

Directions for care and cleaning, laundry, household and sporting equipment

Catalogs-general such as Sears and Penney's

Catalogs-supplies and equipment related to the vocational field

Regulations, specifications, and applications related to automobiles, motorcycles, and boats

Consumer information materials

Application-job, credit, and loan

Tax forms

Menus, greeting cards, programs for recreational events

Books related to the vocational field which are high in interest, and low in difficulty

PART II: STRATEGIES FOR DEVELOPING VOCABULARY AND COMPREHENSION SKILLS

VOCABULARY

Overview of Vocabulary Study

A major need of vocational students is mastery of the vocabulary of the subject being studied. Vocabulary includes the association of words (speech symbols) with an understanding of the meanings, or concepts, represented by the words. When printed aids are used in learning, vocabulary also includes the ability to recognize the printed form of the word. The task of developing vocabulary ranges from supplying names or labels for objects or ideas already within the students' experience, as claw hammer to specify a hammer that can be used to draw nails, to providing experience, concrete illustrations, and words for the process represented; for example, distributer cap in an automotive mechanics class.

The ability to identify the printed form of words depends upon the skills of sight recognition, use of context, knowledge of structural elements, use of sound-symbol relationships (phonics), and ability to use the dictionary (or specialized glossaries). Each of these skills will be discussed individually.

Instructors must be aware however, that these techniques are more often used in combination than separately, and that students need reminders and practice in applying the skills which have been taught in earlier classes. Instructors also should be prepared to form judgments regarding which of the skills should be emphasized with particular individuals or groups of students. Furthermore, instructors will decide which word recognition skill to reinforce based on the characteristics of the word.

Consider distributor cap (automotive mechanics). Using structural analysis the student is reminded of cap as something worn on the head and bottle cap as something closing the bottle. Attention is called to the or ending as in doctor and elevator which indicates the person or device which does something. Then the root distribute is taken up: the students often have books or papers distributed. At this point the means of recognition have been reviewed and the meaning of the term has been partially developed. The instructor then tells or shows the class the specific process related to the cap. The use of structural analysis has aided both in the identification and the development of meaning.

Similarly the instructor in a nursing assistant class would use structural analysis but would also employ contextual and phonic analysis for sphygmomanometer. "The sphygmomanometer showed the patient's blood pressure to be 185/100." Here the meaning of the whole term is easily derived from the sentence and the students' probable understanding of the suffix meter. They will need at least minimal explanation of the elements sphygmo and mano, which are not at all common. The instructor will especially need to call attention to phonic elements which will

help the students to say, write, and remember the word. The ph spelling of the f sound is fairly familiar, but the sph (sf) blend is not. The vowel sounds and accent for the elements mano and meter change when they are combined.

In summary, the "what" of vocabulary instruction for vocational classes, as for any content, is word knowledge. This word knowledge includes both the meaning of the words and the skills for identifying the words in print. Next to be considered is the importance of vocabulary in mastery of the subject being studied.

There are two reasons for teaching vocabulary as part of vocational instruction which override all others that might be mentioned. First, knowledge of word meaning contributes more than any other factor to comprehension (Johnson and Pearson, p. 37, citing the work of F. B. Davis and others). Without comprehension no subject can be mastered. Second, proficiency in the technical terms of a vocational area is highly motivating to the student. The ability to use fluently the "jargon" of a trade can make some indifferent students come to life. The language marks one as a member of the "in" group in a part of the adult world. Why?

The **Vocational Reading Power Manual** cites three factors that make the teaching of vocabulary valuable (Butz, p. 130).

1. Reading test scores show that the more vocabulary taught, the better the comprehension scores.

2. When students master more content specific vocabulary, they also master more content area concepts.

3. When vocabulary instruction is applied in a consistent manner, it provides reinforcement and repetition which results in the mastery of content concepts as well as reading skills.

In order to improve content learning through vocabulary growth, the teacher must cultivate the students' sensitivity to words by many means. Charts, bulletin boards, labels, and written assignments afford visual exposure to content vocabulary. Discussion is planned so that the words are heard and spoken. Incidentally, well-guided small discussion groups, or study teams, allow more students oral practice than whole class discussion provides. Games, practice activities, and recreational reading give further opportunity for students to use the words. At the meeting of the International Reading Association in Boston in 1965, Dr. Olive Niles pointed out that the most important objective of vocabulary instruction is: The student should develop a love affair with words. The vocational teachers's enthusiasm for precise expression in the subject can be contagious. How?

Vocabulary study is aided if teachers and students are aware of certain guiding principles that underlie word knowledge (Adapted from Strang, pp. 240-241; refer to Reference-Resource List).

1. A word is not an object; it is a symbol for an object or idea.

2. Words that are pronounced the same may have entirely different meanings, e.g.:

   bear - to carry, to give birth
   bear - an animal
   bear - naked

3. Words have multiple meanings, e.g., tongue:

   The angry boy stuck out his tongue.
   Make a tongue-and-groove joint for these boards.
   Shoe laces hurt when there is no tongue.

   The unabridged Oxford dictionary gives more than 200 meanings for some words.

4. Words may have both literal and figurative meanings, e.g.:

   Today we can tomatoes.
   The trash can is full.
   Can the chatter, or stay after class.

5. Words may change their meaning over the centuries. "Nice" used to mean "precise" or "fussy" and still does in some instances. Some words that started out with favorable or neutral connotations have acquired unfavorable ones: secret agent, informer, stool pigeon, inhibition, vulgar (of special interest to distributive education classes).

6. Words take their exact meanings from the context in which they are used. The dictionary defines only certain limits within which a word may range. The situation in which the word is used, the other words used with it, and the ends in view all affect its meaning.

7. Vocabulary, morphology (understanding word elements), and syntax (grammatical relationship of sentence parts) are "the big three" of reading comprehension.

8. Words move to action;they are switches that turn on certain habit patterns. Words may certainly help or hinder a person's success.

9. Rich vocabularies are the fruit of much firsthand or vicarious experience. A precise vocabulary is the product of a keen interest in words as symbols on the part of an intelligent individual.

10. Abstract words are generally the most difficult.

11. Long words are often difficult, but the best indication of the difficulty of a word is its degree of concreteness and its familiarity in use, not its relative length. (Sphymomanometer is long but concrete!)

Another aid to teaching vocabulary comes from Harold Herber. He has developed criteria for selecting words that should be carefully taught (Herber, pp. 130-143).

1. Key Concepts

   The concepts important to the topic are identified and the necessary words are listed—often more words than there is time to teach carefully.

2. Relative Value

   Although all words are important, some are more essential to the subject than others. This consideration may reduce the list.

3. Students' Background

   Subjectively or through an informal test the instructor finds that some of the essential words are known or partially known by the students. The list is further reduced.

4. Promotion of Independent Learning

   The careful teaching of some words requires the instructor to review and demonstrate strategies mentioned above such as use of context, word analysis, and use of glossary or similar reference. If further reduction in the list to be emphasized is necessary, those words that provide examples of techniques for getting meanings independently should be chosen.

An additional guide for selecting the words to be taught can be found in Appendix I-B.

These principles and criteria should be reviewed in connection with later study of the Directed Reading Activity and Study Guides.

Self-Check for Overview of Vocabulary Study

Before each statement put A for agrees with the discussion, D for diagrees with the discussion, or N for neither mentioned nor implied by the discussion.

_____1. In this discussion vocabulary is said to include only knowledge of the meanings which words represent.

_____2. Knowledge of word meanings is the greatest single contributing factor in reading comprehension.

_____3. Students understand some words that they do not recognize in print.

_____4. A thesaurus may be helpful in some subjects but has little usefulness in vocational studies.

_____5. Mastery of the language of a trade can enhance the student's self-concept.

_____6. It is necessary to teach directly all the words that are important to a given topic.

_____7. Good students can look at a list of words and tell with certainty the exact meaning of each one if they have encountered the words in the last three weeks.

Practice Activity

If possible, work with an associate. List the ten words you consider most important for students to know in the next unit you plan to teach. Then apply the criteria of relative importance and student background to the list and reduce the number to six. Share and discuss your lists. Remember that the students in each class are different so the lists should not necessarily agree.

Further Reading

Butz, R. **Vocabulary Development**, pages 129-178.

Herbert, H. L. **Vocabulary Development**, pages 129-172.

Smith, S. J. **Vocabulary Development and Word Perception Skills**, pages 34-37.

WORD MEANING

Students in vocational classes must learn technical vocabulary related to the subject. This includes:

1. Unknown words that represent concepts not familiar to the student. These words constitute the most difficult teaching task. For example, the professional chef must understand roux. Why?

2. Known words which the student already associates with a common meaning but which, in the field, stand for a specific new meaning. Without instruction, these words might impede learning. The reader who understands threading a needle could easily make wrong assumptions about the plumber threading a pipe.

3. Unknown words which refer to known processes or ideas. The student cannot recall and use experience if its label is not known. "The thing you take out and wipe and put in and take out again to see if you have any oil—I don't know what it is." Learning dipstick is a comparatively easy, but necessary task.

Words can communicate meaning only in so far as they trigger related experience in the mind of the person receiving the message. Recognition of this fundamental principle has, of late, led authors to speak of concept development in relation to developing meaning of words and phrases. At times students have been encouraged to spend time memorizing pairs of synonyms in the name of studying word meaning. If the student does not have a sound understanding of either member of the pair, the activity is shallow indeed. The students may be able to pass a test in school, but would by no means be prepared to apply real meaning in the world of work. New learning must start with what the student already knows and be anchored in the experience the student brings to the task. Why?

It is true that comprehension must be based on experience, either real or vicarious. For this reason teachers contrive events, prepare field trips, show objects, engage as many of the students' senses as possible, and dramatize. Experience alone, however, will not as a rule result in understanding. A sharecropper's child could, conceivably, have spent a lifetime traveling forty states and yet comprehend less about the country than the child who never left home.

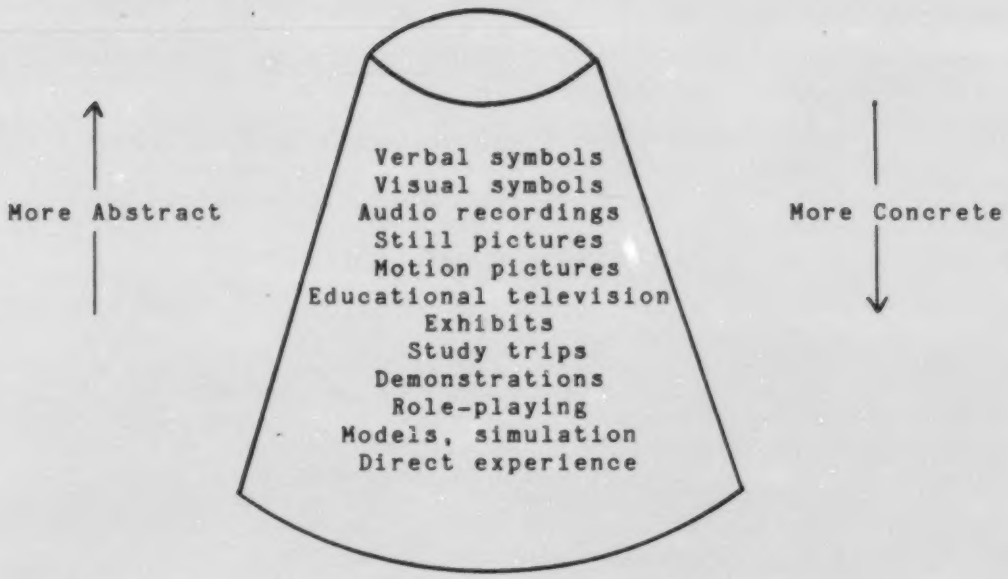
In addition to having experience, the learner must have sorted, labeled, and classified experiences if his/her fund of meanings is to be increased effectively. For most people this aspect of learning requires guidance, as from a teacher, parent, or companion. Academicians speak of generalization and discrimination in relation to this aspect of acquiring meaning. The instructor planning to develop a concept tries to see that the students have some sense of what may be included in the idea and what is not included.

For developing concepts effectively and efficiently teachers find Edgar Dale's Cone of Experience a useful reference (Figure 6). Its usefulness is increased if the accompanying comments of Allington and Strange and of Gagne and Griggs are heeded (**Learning through Reading**, Allington, pp. 153-154). How?

> The effectiveness of . . . strategies in part depends on the prior experiences or background knowledge of the learners. The type of concept to be developed also exerts constraints on the strategies to be employed. However, the teacher should attempt to identify the strategy for most effectively and efficiently developing the understanding desired. Dale (1969) attempted to rank various types of experiences on an effectiveness scale. His cone of experiences ordered various instructional strategies on a continuum from direct to abstract experiences. Dale's (1969) Cone of Experience is an attempt to roughly list the most useful types of experiences for learning. According to Gagne and Briggs (1974), a good rule to keep in mind using Dale's Cone of Experience is: "Go as low on the scale as you need to in order to ensure learning, but go as high as you can for most efficient learning."

Figure 6

Cone of Experience



Possible Steps for Developing a Concept in a Current Topic

1. Pronounce the word-show it on chalkboard, card, or transparency.

2. Use it in one or more sentences.

3. Allow volunteers to use the word in a sentence, but do not give an opinion on whether the example is correct or not.

4. Read one or more sentences in which the word occurs in teaching materials being used.

5. Elicit from the class or demonstrate information about the meaning which can be derived from the sentences.

6. Present and discuss examples, pictures, or diagrams if available or appropriate.

7. Elicit from the students or present ideas that are similar or contrasting to the concept.

8. In any way possible relate the new idea to student experience or prior knowledge.

The number of these steps that will be used will depend on the complexity of the concept, the degree of understanding needed for present learning objectives, and the students' possession or lack of related background experience.

EXAMPLE

In **Sales-Accounts Receivable Systems** (Archer, p. 463) the term invoice occurs. The following steps are part of the preparation for studying the unit.

1. The instructor says the word and writes it on the chalkboard.

2. The instructor:
   The invoice for our book order has already come. Yesterday the plumber left the invoice on the kitchen counter.

3. Students volunteer:
   My mother said her vacuum cleaner came without an invoice.
   Mrs. Smith, who's grumpy, says she will invoice the law if Rags comes in her yard again.

4-5. Instructor:
   These sentences are in our text:
   Invoices are generally prepared with several carbon copies.

Student:
At least we know an invoice is written on paper.

Instructor:
When all vital facts are assembled and credit clearance has been given, a customer's bill or invoice is made up.

Student:
Well it's the bill. Why didn't they call it that in the first place?

Instructor:
It looks like invoice is another name for a bill but let's check the text to be sure they did not mean either an invoice or a bill would be made up. Open your books to page 463. What is the topic printed in blue near the bottom of the first column? Yes, it's BILLING and the sentences I read are found under that head.

6. Instructor:
In a little while you will each get a copy of a real invoice. I want you to check its information against the text list of what is usually on an invoice.

7. Instructor:
Take a minute and think about this question.

When you went to Shoney's, did the waitress give you an invoice?

When you shopped at Winn-Dixie, did you get an invoice?

The fifteenth of the month we received a bill from Sears. Was that an invoice?

Discussion follows in which the teacher avoids passing judgment on whether opinions are correct or incorrect but does emphasize the similarities and differences among sales checks, invoices, and monthly statements.

8. Instructor distributes invoices to students for comparison and discussion.

To some instructors the treatment described in the preceding paragraph may appear to be inefficient. The word invoice was accompanied by a synonym in the text. In some cases the instructor would be right. For many students, however, bill = invoice is too fuzzy a concept to suffice in a course and career requiring understanding of general office practice.

Other means of strengthening concepts and aiding vocabulary precision include classification activities and graphic representation of the relationships among pertinent terms. The latter are sometimes called meaning hierarchies and often are referred to as graphic organizers.

An example of classification from plumbing would be:

WRENCHES	. pipe wrench . off-set . chain wrench . monkey wrench . strap wrench

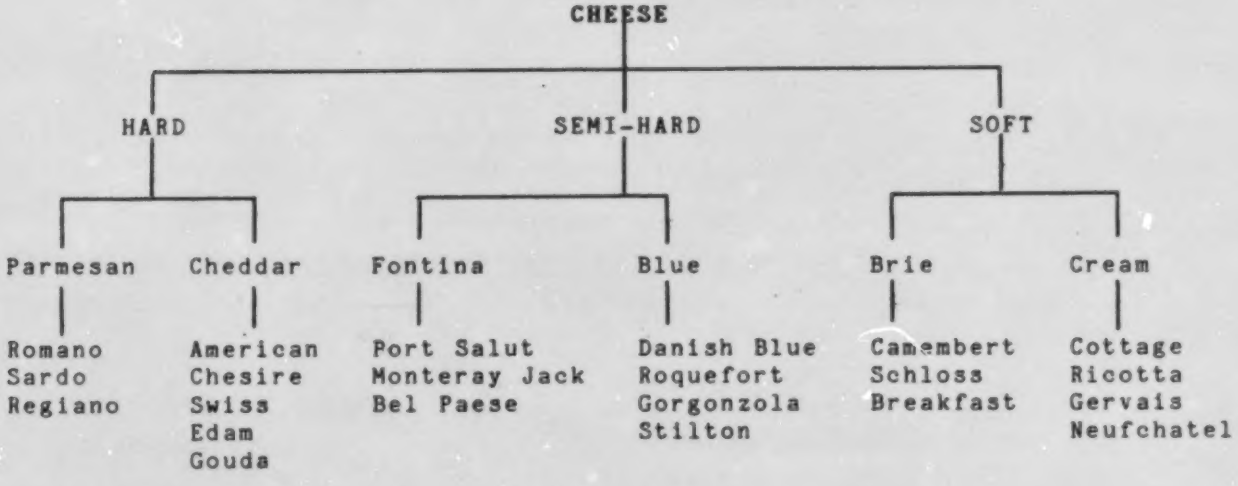
Another (and somewhat more demanding) kind of classification activity requires the student to mark out the item which does not belong. Here the relationship among the listed terms must be discerned and the non-member of the group must be identified. An example from industrial drafting would be:

In each line cross out the term that does not belong.

A.	Triangular pyramid Square pyramid	Cheops pyramid Hexagonal pyramid
B.	Offset sections Caesarion section	Broken-out section Revolved section

The meaning hierarcy (Figure 7) organizes information from **Cooking for the Professional Chef** (Wolf, p. 128).

Figure 7



All that has been said in connection with development of meaning for completely new words applies to the teaching of specialized meanings for words that are already familiar in their common usage. Skill in using contextual analysis is particularly valuable in helping to establish the new meanings. The language surrounding unfamiliar words affords clues to their meanings and enables the reader to choose correctly when encountering words with multiple meanings. Figure 8 is a list of some of the more common kinds of clues found in context. Also included are signals which may alert the reader to the clue. What?

Figure 8

Signals	Context Clues
Is, means, involves	Definition
For example, e.g., for instance	Example or description
Exclamation point, underlining, quotation marks, italics, boldface	Punctuation and typography
Inflectional ending	Language patterns such as word order and word form
Commas, dashes, parentheses	Synonyms and appositives
Instead of, rather than, unlike, not	Contrast or antonym
Like, as in	Comparison
In short, to summarize, indeed, altogether, thus, that is	Mood or summary
No signal, expectation based on linguistic and experiential background	Common experience

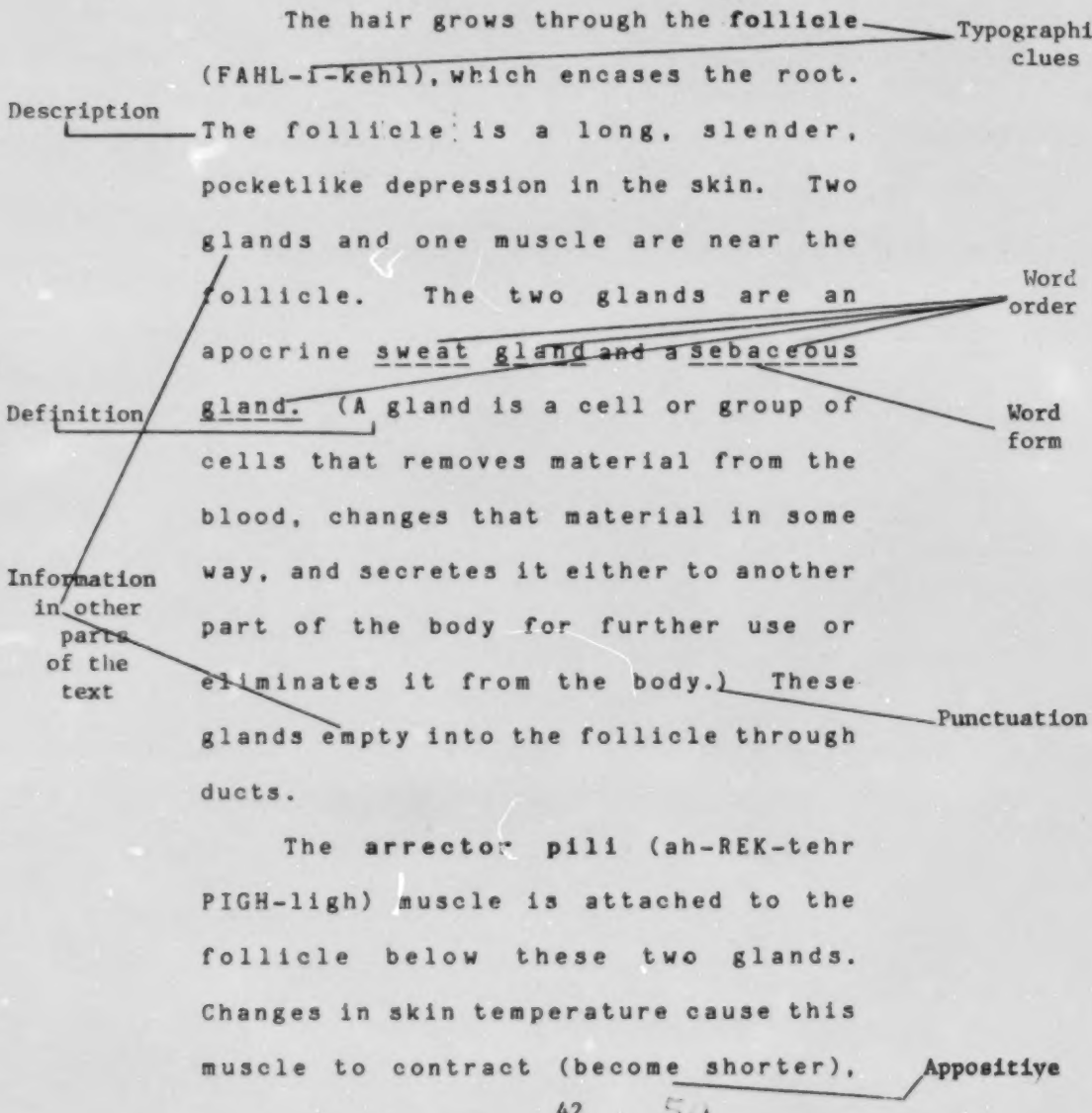
Context, oral or written, is the natural way that language develops and the way most meanings and words are acquired. Students should be made aware of this fact. Often, if a class is asked how they learn new words the glib answer is, "From the dictionary." Students must be alerted to the fact that, for meaning, the dictionary is usually inadequate unless the context in which the word occurred is known. Authors of modern vocational texts often have provided a rich collection of context clues to the meaning of words. Yet, without reminders these aids for increasing word knowledge may be ignored. Why?

The teacher can prepare a chart of duplicated list of kinds of context clues like Figure 8, then point out or have students locate examples of clues in a passage that is being assigned. Probably a good sequence is to show the clues at one time and later have the student identify them. By some means the students must be reminded that they may find clues in context which are not listed on the chart being used.

EXAMPLE

Figure 9 is a passage from the **Professional Cosmetologist** (Dalton, 1979, p. 40) in which technical vocabulary seems to abound. Arrows indicate use of some of the clues listed.

Figure 9


The hair grows through the **follicle** (FAHL-i-kehl), which encases the root. The follicle is a long, slender, pocketlike depression in the skin. Two glands and one muscle are near the follicle. The two glands are an apocrine sweat gland and a sebaceous gland. (A gland is a cell or group of cells that removes material from the blood, changes that material in some way, and secretes it either to another part of the body for further use or eliminates it from the body.) These glands empty into the follicle through ducts.
The **arrector pili** (ah-REK-tehr PIGH-ligh) muscle is attached to the follicle below these two glands. Changes in skin temperature cause this muscle to contract (become shorter),
Typographical clues
Description
Word order
Definition
Word form
Information in other parts of the text
Punctuation
Appositive

resulting in "goose bumps." Sudden fright also causes contraction. During this contraction, the hair stands straight up. The contraction of this muscle also forces sebum into the follicle, where it lubricates the hair and skin.

Punctuation

The heavy type and respelling of follicle are more related to word identification than to deriving meaning. Several of the clues represented need no comment -definition, description, appositive or synonym. The quotation marks around goose bumps alert the reader that the figurative meaning of the expression is intended. The meaning of sebaceous comes from a combination of familiarity with language patterns, information in other parts of the passage, and life experience.

The location of sebaceous immediately before gland shows it probably is an adjective describing gland; so does the ous suffix and the arrangement parallel to sweat gland. This is as far as language patterns go in helping with sebaceous. Information in other parts of the passage, some from the next paragraph, is studied. This sebaceous gland secretes something. It empties into the follicle. " . . . This muscle forces sebum into the follicle." At this point only two glands have been mentioned as emptying anything into the follicle. Sebum could well be the noun from which sebaceous comes. No one has heard sweat, that the other gland secretes, called sebum. ". . . It lubricates . . ." From experience with language and with life the student knows that oil lubricates automobiles and machinery, and he/she also knows that hair becomes oily. To conclude that the sebaceous gland is an oil gland is no wild guess. It is a well-supported inference.

Words that have both common and content specific meanings are called slippery words by Dorothy Piercey (Piercey, pp. 6-9). For them she suggests a teaching procedure called Talk Through. This procedure starts with context and helps the student discover the specific meaning from associations with his/her everyday world. From an industrial arts text comes this sentence. "One of his jobs in the bindery was to spotcheck the quality of the spines." The teacher identifies as everyday knowledge of the students: the vertebrae of the back, their purpose; and a spineless person, no backbone, a pushover. "Does anyone here have a spine?" "What does it do for you?" "Ever hear of a spineless person?" "What wouldn't that person do?" "What does a bindery produce?" "Explain what kind of spines are meant here and why they must be checked.

The author has also devised a most enticing game to help students in automotive mechanics master slippery words of that field. It is found in Appendix I-C.

Learning technical names for concepts the student already has is comparatively easy, but it usually does not happen without encouragement from the instructor. The text for agriculture science says, "For best results pesticides must be applied exactly as the manufacturer directs."

The instructor displays:

pesticides

pests	suicide
pestilence	homicide

After meanings of the last four words have been elicited from students, someone will probably explain pesticide. The instructor will continue with "What did you do about rats besides set traps for them?" "What did Mr. Jacobs do to prevent weeds in his soybeans?" "What do you do about flies and mosquitoes besides swat?" "What have you been calling your pesticide?" "Aw, bug spray!"

This was an opportunity to demonstrate the use of known word parts to derive the meaning of an unfamiliar word, which in this case represented a concept within the students' experience. Structural, or morphemic analysis can be useful in unlocking the meaning of new words.

Why? Students should be guided in the use of known morphemes because this is one more tool, alone or in combination with context and dictionary, for gaining independent word power.

How? The first answer to how to teach morphemic analysis is, "With discretion." Combining known meanings of parts of unknown words may help identify possible meanings or confirm approximations drawn from context. On the other hand, the mal- of maltreat and malfeasance is not applicable to malleable and mallard.

As with other skills, the vocational instructor teaches morphemic analysis to facilitate content study. Cosmetology students encounter, "In . . . parts of the hair bulb are melanocytes that make melanin and cells for making . . . Melanin gives hair its color." (Dalton, p. 40). In order to decide whether to spend time on the suffix -cytes, the instructor examines the glossary or vocabulary lists for later chapters. This word element occurs at least five more times. Context here presents an ideal occasion for teaching: -cytes, a combining form indicating a connection with cells. The instructor may also display a list of words that will be met later.

melanocytic lymphocytes cytoplasm erythrocytes leukocytes

The list at this time demonstrates the usefulness of the element -cyte. Further discussion of the meanings of the words listed would most likely be inappropriate at this point.

Another appropriate activity for encouraging students to watch for recurring morphemes is as follows.

We have just learned the word melanocyte. Notice that this word part -cyte sometimes ends in s, sometimes in ic, sometimes in o. Whatever the ending, the meaning indicated is some connection with cells. There are other word parts we shall be using in cosmetology. I have prepared this chart of some of them for the class (Figure 10). (Instructor displays large chart.) I also have a copy for each of you to put in your notebook.

(Instructor distributes copies.)

Figure 10

Word Part	Dictionary Meaning	Sentences from Textbook
-cide	A suffix meaning killer or killing	
-cyte	Combining form denoting relation to cells	
derm-	Combining form meaning skin	
onycho-	Pertaining to the nail	
-osis	Suffix meaning condition or process, usually diseased	
peri-	Prefix meaning all around, about, or near	

Let's read the charts together. (All read aloud.) Remember, you are not asked to memorize this chart. Put the chart where you will see it once in a while. When you come across one of these word parts in your text or other reading, copy the sentence. Bring it to me and then put it on the class chart which we will have on this wall. If your sentence comes from the text, write the page number with large numerals. If the sentence is taken from some other source, pencil in the source and page in small letters. Be sure to add your initials in chart size letters.

If the space for sentences becomes full, we can extend the chart. If you want to add other word parts you think are useful to cosmetologists, you may put them at the bottom, and, if necessary, we shall extend the chart there too. From the class chart you can all fill in your own charts.

This kind of assignment provides an opportunity for students whose usual work is, perhaps, undistinguished to gain recognition. Unfortunately, ongoing assignments like this one are easily forgotten. That possibility can be taken care of by the instructor. When a reading assignment containing one of the elements on the chart has been completed, the instructor asks if any word parts were found. This inquiry should come only after students who did remember to watch for parts have had a chance to display the additions.

What?

To this point, the discussion of developing word meaning has focused on building concepts, using contextual analysis, and using morphemic analysis. Students also need to know how to use a dictionary approach. In vocational education it is more productive to think of dictionary approach than of dictionary. The usual student dictionary is often inadequate for the word meaning needs of vocational students. A conventional dictionary large enough to have some of the necessary specialized meanings can indeed be intimidating to the students. Specialized dictionaries related to the field of study,on the other hand, have great value. These include substantial commercial works such as **Dictionary of Agriculture and Allied Terminology** (Winburne). They also include less elaborate word lists ranging to key word vocabularies compiled by a single teacher and lists of new words accumulated by each pupil.

Reference to a glossary or dictionary often can confirm and sharpen word meaning the reader has achieved from using context and structure. The student identifies the meaning appropriate to the context. Thereafter, study of the formal definition helps the student understand what is and is not included in the meaning of the word. Sometimes related meanings of the word and additonal information on its derivation assist the process of clarifying the present use, one more step toward independent word power.

In addition to help for learning the meaning of content words, glossary lists, whether on sheets or on file cards , are an aid to studying and to planning instruction.

Figure 11 is a sample of a vocabulary card prepared by a food service student.

Figure 11

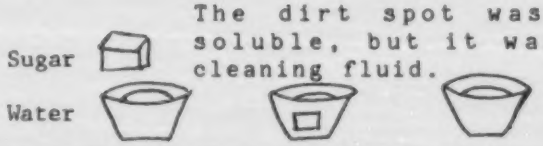
water-soluble

SAHL yoo b'l

"Vitamin C, a water-soluble vitamin (dissolves in water), is one of the most easily destroyed vitamins." How?

Capable of mingling completely with water (a liquid).

The dirt spot was not water-soluble, but it was soluble in cleaning fluid.



At the very least students' cards or notebooks should contain the word and its definition. More information greatly increases the probability that entries will be effective aids to learning. The sample shows the sentence from the text, which itself contained a meaning aid. Next there is the definition formed with the help of a dictionary followed by an original sentence. Finally, there is an original illustration. Producing an entry of this type almost guarantees the student will understand and remember. The spacing of the information is designed for review and study. By covering one side the student can look at the word, give the meaning, then remove the cover to see if the response was correct; or the process can be reversed so that the student produces the word for the meaning. A choice may have to be made between many entries in student word files and more complete information on each entry. Fewer entries of the more complete type will probably lead to greater content mastery. Required production can be set low, and students can be encouraged to share.

A note is in order regarding abbreviations, symbols, and acronyms that occur frequently in certain subjects. Because these may interfere with study, they should be included in key vocabulary lists. They need to be taught by that means or some other. Examples are found in Appendices I-D, I-E, I-F and I-G.

Whatever type of material the students are using in the dictionary approach to mastering word meaning, some skills may need reinforcing. These skills are 1) use of alphabetical order; 2) use of guide words; 3) use of pronunciation guides; 4) in some cases ability to read the derivation source; and, of course, 5) selection of definition to fit the context. Since some students will have mastered some of these skills, practice should be planned for small groups and individual assignments.

For the teacher a key word glossary or a set of vocabulary cards means the work of making many reinforcement activities is already half done. The card (Figure 11) should be prepared so that it can be cut in half. A set of these xeroxed, cut, and shuffled make a deck that can be used for games patterned after concentration and go fishing or as the task cards for board games. The file can also be the basis for constructing crossword puzzles, word search puzzles, and scrambled word puzzles (Appendices I-H and I-I) that use meaning clues, analogy activities, and games patterned after the Slippery Word Game in Appendix I-C.

Figure 12

SCRAMBLED WORDS, from words found in **Technical Sketching** (Spence, pp. 17-27)

DIRECTIONS: Unscramble the terms below and write each beside its definition.

isax jorma	trimiescio lerud	grinwad stericoim
lamettep	pilsele	traportorc

1. A semicircular instrument used for constructing drawings. _____
2. An oval shaped figure _____
3. A plastic tool used to speed up drawing _____
4. A kind of graph paper printed lines that are vertical, horizontal, and at 30-degree angles to the horizontal _____
5. The line through the center of an ellipse at its longest dimension _____
6. A drawing that shows three dimensions of an object _____

Figure 13

Word Search Puzzle (Piercey, p. 226)

IT'S THERE SOMEWHERE

r r e e e r e t n i o j o h m g i
e e s c m i n u t i s v a g s i o
i n m t e t g r o f e e r i t g n
n d i m t a v f u d a r e n a l p
t w i t a o e o s e a i b a o a e
h l l n s h r h j o r d a n b r i
p c o a g b a e l k l a c e m d w
m m e i i p y r y v a y u r l h t
a w j i e o o y e o u e o q e a d
l h e r t g f n s y s e e y s a b
c h e r u i e l e v e b o u i k o
g o n l p e t q t o e b t h h u t
e r a w r u e i e u i l i n c t d
e t o u t o n e h t a l a t o h n

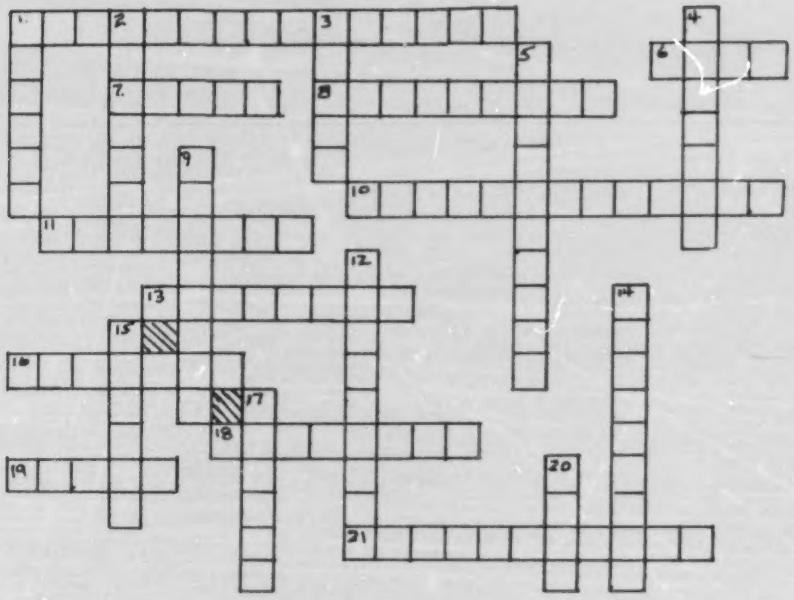
Draw a box around the terms for the following descriptions.

1. Tool for smoothing and straightening the edges of boards
2. Cutting hand tool for carving or shaping wood
3. Power tool used for rounding edges on molding
4. Power tool used to shape table legs
5. Power machine that removes rough or excess surface from a board
6. A miter joint in which two pieces of wood meet at other than a right angle
7. Thin layers of wood glued together to form plywood
8. A groove into which the end of a board fits
9. A guide for locating proper places to drill holes
10. A device with two movable parts brought together to hold pieces of wood tight
11. A measuring device for truing angles
12. A hand tool, usually used for driving nails

KEY: 1. jointer 2. chisel 3. shaper 4. lather
5. planer 6. bevel 7. veneer 8. dado
9. jig 10. clamp 11. square 12. hammer

Figure 14

Crossword Puzzle (Blockhus, p. 76)



Across

1 Deposits made in a checking account
6 An amount owed by one person or business to another
7 An order to a bank to pay a stated sum of money to another person or business
8 A general increase in prices
10 Deposits made in a savings account
11 A charge made for the use of money
13 The portion of a bank's deposits that are not loaned
16 The amount on deposit in a bank account at any time
18 One who supplies goods, services, or money on credit
19 A medium of exchange
21 The purchasing power of a workers' wages

Down

1 One who owes for goods, services, or money obtained on credit
2 A bank's record of a customer's deposits and withdrawals
3 The value of anything expressed in money terms
4 Money put in a bank account
5 Money taken out of a bank account
9 Coins and paper money
12 Anyone who deposits money in a bank
14 A general decrease in prices
15 To trade one product or service for another
17 A means of obtaining something of value in exchange for a promise to pay at a future time
20 A printed promise to pay a certain sum at a future date

The manual for **VRP: Reading Power in the Content Areas** (Butz, pp. 143-146) presents information on the value, construction, and use of Key Vocabularies. Appendix I-E reproduces some of that information. The practice activity below is similar to one suggested in the VRP manual.

Self-Check on Word Meaning

1-3. List the three ways in which students may "not know" technical vocabulary of a vocational subject.

4-5. Explain why the teacher should go low on Dale's Cone to ensure learning and why high on the Cone might be efficient.

6. By what means do we learn most of our meanings and words?

7. If you did not already know what a morpheme is, you should now know it from context. In your own words define morpheme or define morpheme analysis.

8-10. In addition to the process of total concept development three techniques for learning word meaning have been explained. List them.

Practice Activity

Using the six words selected in the activity from Overview of Vocabulary Study, prepare entries for a Key Word Vocabulary. For each entry give 1) the word; 2) a pronunciation aid; 3) a definition in the words of the text or of the dictionary; 4) a simpler definition in your own words; and 5) an original sentence using the word.

Evaluate your entries by recalling what you learned about readability and about what makes words difficult. Decide if your definition and sentence could be made more readable and still explain the entry word adequately.

Further Reading

Estes and Vaughn. **Developing Meaningful Vocabularies**, pp. 185-194.

Lamberg and Lamb. **Learning Technical Language**, pp. 40-44.
Word Relationship, pp. 44-51.
The Personal Dictionary, pp. 51-53.

WORD IDENTIFICATION TECHNIQUES

When students already know or have been taught the concept represented by a word and recognize the word in oral use, there is still the task of recognizing the printed symbol. Five identification techniques are applicable to this task.

Sight Words

Here sight word refers to words that the student learns to recognize instantly without resorting to analytical procedures. There are a few hundred words that occur so frequently in all reading that they make up a majority of all words read. Vocational students, like all readers, need to know these words automatically. In every subject certain words, usually technical terms, are so essential for studying that they too should be known automatically. What?

Students should not be expected to learn as sight words terms they do not understand. Meaning, however, is not a consideration for the two sets of words discussed in the preceding paragraph. Secondary students have used the high frequency words in oral communication for years. With each new topic teachers start early to develop the meaning of essential specialized terms. Simultaneous attention to the appearance of the word helps remembering. The ability to identify these two groups of words instantly enables the student to concentrate on the message the words convey. Attention need not be diverted to figuring out the words. Why?

A majority of secondary students will need no help with the high frequency words. Besides sight words, these are sometimes called service words. Some students, however, will not know the words. In vocational classes these students may for the first time feel the need to read. They can be shown that the high frequency words are a real bargain—a great deal of reward for the effort expended.

Appendix I-J contains the first five hundred words of the American Heritage Word List. A note at the bottom of the first hundred states that the list constitutes about fifty percent of all the running words a student will encounter.

Using a set of cards that duplicate the first hundred words the instructor checks the poorer readers in the class to see if they can pronounce the words instantly. Students who do not show mastery are given lists so they can practice the words with a friend or with a tape until they can say the words instantly. Succeeding sets of a hundred words do not represent as high a proportion of the words the student will meet. Yet mastery of these three, four, or five hundred words will reduce the burden of reading to the point that some reading will become a pleasure, and the student's ability to learn the vocational subject will be substantially increased. How?

EXAMPLE

Here is a passage of 110 words from **Exploring Careers in Child Care** (McFarland, p. 50). Words in the first hundred have been circled for a count of sixty. Samples will vary, but they will rarely fall below forty per hundred words of running text, and they will often be higher than fifty words per hundred, as in this sample.

Communicating will be one of the most important things for Pam and Ed to learn. Many marriages fail because husband and wife cannot communicate their ideas and make decisions they agree to use as their rules and policies. They must decide together how much money is to be spent, how many children to have, what kind of car to drive, and how to spend their leisure time. In an enterprise, decisions that will guide the business activities are also in the form of rules and policies.

"There are so many things to do," said Pam. "We both need to have blood tests at the doctor's office before we get married."

The second kind of sight word practice recommended for vocational classes relates to words from a current topic of study.

The following list of words occurs in the chapter "Sales—Accounts Receivable" (Archer, pp. 460-472).

Receivable	Tabulating	Prepunched
Verifying	Interspersing	Clerical
Invoice	Routine	Prospective
Legerless	Customer	Dispatched
Posting	Calculator	Preprinted

A sight word practice sheet might be prepared this way.

DIRECTIONS

In each line circle the two words that are exactly alike.

Use the stop watch to measure your time. (To use a sweep-second watch record beginning and ending time in seconds; then subtract.)

When you finish, get the key from the class librarian to check your accuracy. Both words in a line must be circled for the item to be right.

Divide your number of correct items by 25, the number of items in the exercise.

Record this as a percent on your progress chart.

Criterion for mastery is 96% in 40 seconds.

1. posting pasting parting postman posting

2. innerspring interspersing interesting interspersing interpreting

3. perception perspective prospective prospecting perspective

An exercise of this kind should have approximately twenty-five to thirty-two items. If fewer words need highlighting, repeat some words varying the positions. The activity lends itself to independent performance and most students enjoy the timing aspect. Appendix I-K provides a more extensive description and suggests variations for this kind of sight word practice.

Here are some other ways to develop sight words.

Student

1. Look at the word; say it; check your response with a friend, language master card, or a tape. Consider the word learned when the response has been correct three times in a row on three different days. Review once a week for three weeks.

2. Write the word; check its spelling; a few times is enough. Type the word; check the spelling; a few times is enough.

3. If the word is really hard to remember, write it very large (letters one to two inches high) while saying the word so slowly that the saying begins and ends with the writing.

4. Choose three or four words being studied. Skim one-half of the front page of a newspaper until you have circled each word three times. This means, that if you have found each word three times, you have finished. If you have not found them three times when you have skimmed the half-page, you are still finished.

Instructor

1. Encourage activities above.

2. Expose the word; but

3. Have the less able students make the labels, lists, etc.

4. Use the words in written directions.

5. Contrive reasons for the students to write the words; then

6. Arrange ways for students to proofread each other's work.

7. Make, or better yet, have students make games where the word must be read in order to progress. Prefer games in which winning is based on a spinner or dice rather than on correct response. If the student does not know the word, it is all right for another player to tell it. The student still must say it in order to move forward or cover his card.

8. Use word search puzzles. For sight word development hide the words horizontally, left-to-right only. For spelling practice, vertical and right-to-left positions may be acceptable.

9. Provide scrambled words activities.

Figure 15 is a sample sight word activity that applies to distributive education. Others for home economics are in Appendices I-L and I-M.

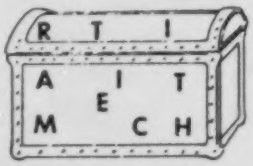
Figure 15

WORD SCRAMBLE (Sasse, p. 128)

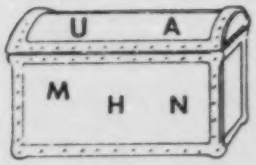
Below are ten chests full of scrambled letters. The letters in each chest can be used to write out a skill needed by distributive workers. Use each letter just once. How many can you unscramble?

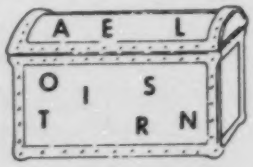
The lines drawn below each chest will help you. One letter goes on each line. Write the skills in pencil so that you can erase and start over if necessary.

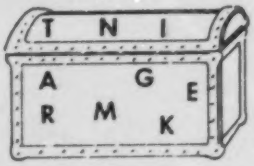
1. C _ _ _ _ _ _ _ _ _ _ _ _ _ _



2. A _ _ _ _ _ _ _ _ _ _

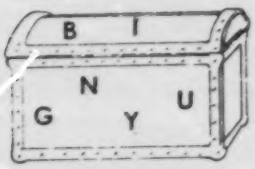


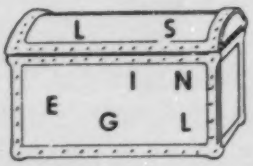




3. H _ _ _ _ _ R _ _ _ _ _ _ _ _ _

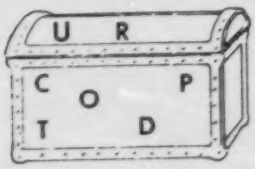
4. M _ _ _ _ _ _ _ _ _ _

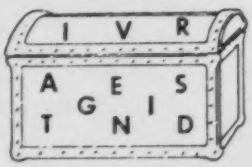




5. B _ _ _ _ _ _

6. S _ _ _ _ _ _ _





7. P _ _ _ _ _ _ _ K _ _ _ _ _ _ _ _ _

8. A _ _ _ _ _ _ _ _ _ _ _

64

Context

Contextual analysis has already been recognized as a means for determining the unknown meaning of a word. It was seen that information surrounding the unknown term gives a basis for inferring the meaning represented. Through contextual analysis, the reader may understand a term and still not be able to pronounce it or to write it. Many secondary students, particularly those who are not very proficient in reading, have a different need. They know and understand far more words than they can identify in print. For such readers contextual analysis is the most productive means of deciding just what word a given set of letters signal. What?

EXAMPLE

Dogs *)('. There is an "##$% in my lunch.

Trees have *)('. You are the "##$% of my eye.

New York is known as the Big "##$%.

In each case the sentence gives the reader clues to words the senseless characters might represent. There are many things dogs might do. There are many things trees might have. The oral symbol bark fits both sentences. Hereafter, the reader can respond bark to the written symbol *)('. By similar reasoning, the reader learns to think apple in response to the symbol "##$%.

Contextual analysis for identifying words should be taught to vocational students because it yields such high dividends. The teenager has a large fund of life experience and, in most instances, considerable command of oral language. With a stock of a few hundred sight words and skill in using context a person can "get along" in modern society. These two skills alone may enable the student to read material that is badly needed or much desired. Practice increases these skills. Satisfaction derived from using reading leads the student to acquire more skills. Sometimes additional skills are developed independently. More often, the ability to use reading for individual purposes changes the student's feeling about reading. The student has become accessible to instruction. A little instruction, perhaps in connection with Textiles II, will produce comparatively big results. This can happen here. With ten minutes of reading instruction three times a week in shop class,Harold might make more reading gain than he has made in language arts class during the last four years. Why?

The first step for teaching use of context to identify words is easy. Students must be taught to go on if the word looks unfamiliar. The uncertain reader who is also conscientious sometimes finds this task difficult to do. The student should go to the end of the sentence and then think what word or words would make sense. It may be necessary to look back and to look forward before deciding what the word is. The clues and How?

processes discussed under Word Meaning are applicable to word identification. The difference is that known meaning and known words are used to identify unknown printed symbols. To illustrate, the French instructor seeing carburetor attached to a piece of machinery would use the label to identify the car part, but the fourteen-year-old car buff could probably use the car part to identify the word.

This use of context, like so many skills, is best taught as the opportunity presents itself during content instruction. The instructor who knows the students' language and experience, nonetheless, can contrive specific exercises to demonstrate its use. The agriculture instructor might successively uncover these sentences.

> Warfarin is useful on the farm.
> It is safe to use in the chicken house.
> It keeps rats under control.

By the third sentence the class knows Warfarin. Some of them may have used the sound of the initial consonant in addition to context. Some of the students who could not read Warfarin alone or in the sentence could have identified it instantly if the word had been written alone and then shown accompanied by a picture of a package of Warfarin, another kind of context clue.

A intriguing exercise using context to identify shorthand characters is shown in Appendix I-N.

Morphemes, Structural Analysis

Morphemic analysis is the process of separating a word that looks unfamiliar in meaningful parts that have been recognized. Sometimes identifying the parts and then putting them back together enables the student to identify the word. Triphammer may look strange, but trip and hammer look familiar. Since both the object and the oral label are part of the reader's experience, analysis has aided word identification. The limitations and procedures of using morphemic analysis to obtain meaning again apply but operate in the opposite direction. What?

Students are reminded to try this kind ofanalysis with unfamiliar word forms because it is one more route toward independent word power. It is superior to phonic analysis because it is more closely related to meaning and because it deals with larger word parts. Why?

Instruction should mainly consist of calling attention to the process when vocabulary is being presented. In subjects where certain prefixes, roots, and suffixes occur with great frequency, those elements can be added to key vocabularies and also to sight words being practiced. How?

Phonic Analysis

Phonic analysis is used to identify unfamiliar words through using the sound-symbol correspondence of letters and letter groups. The reader then blends the sounds suggested by the letters together to arrive at the pronunciation of the new word. If the sound produced approximates a word in the reader's oral vocabulary, the word has been identified. What?

In secondary subjects there are probably more reasons for not teaching phonic analysis than for doing so. The most important of these reasons is that most pupils have been exposed to a great deal of phonics and it hasn't "taken." An argument for encouraging students to at least try to pronounce the unknown word is that meaning gained from context is more likely to be retained if it is associated with some auditory symbol. The rebuttal to this argument is that the reader, having associated meaning gained from context with an erroneous auditory symbol, does not make the meaning-word connection when the correct auditory symbol is encountered. The common sense view is that if phonic elements seem helpful when new words are being studied, the elements should be pointed out. Some phonic knowledge is an aid to spelling. Why?

If unusual sound-symbol patterns such as initial gn-, pt-, ps- occur in assigned reading, they probably should be pointed out. When phonic elements seem appropriate in the presentation of new words, it is more productive to deal with groups of letters than with single letters. Groups of letters are more consistent in the sounds they represent than are single letters. How?

Even though instruction in phonics should be minimal, vocational instructors should not put up with feeling ignorant about the subject. This is especially true in the face of some articles in the popular press which lay all educational ills at the door of too little phonics instruction. Less than an hour of studying an outline of phonic information can make the instructor know that he/she is not ignorant of phonics. Appendix I-O is a summary of phonic information. Other summaries can be found in **Reading Instruction in the Content Areas** (Lamberg, pp. 35-38) and in **Comprehensive High School Reading Methods** (Shepard, pp. 45-48).

Dictionary

The dictionary does provide a means of learning to pronounce new words. For this reason and others, students should be encouraged to use it or similiar references. Knowledge of alphabetical order and use of a pronunciation key are the prerequisite skills. These are usually checked in connection with teaching students to use the study aids the text provides. One caution is in order: some students think they are supposed to memorize pronunciation symbols; therefore, they avoid the dictionary. That wrong idea should be erased!

Self-Check for Word Identification Techniques

Two kinds of words that should be taught to secondary students as sight words are (1) _____ words, also known as service words, and (2) _____ words essential to the topic being studied. Some secondary students (3) _____ more words than they can recognize in print. By (4) _____al analysis these students can use the words they do know to enable them to identify words which they do not recognize. (5) _____may be used to pronounce an unfamiliar word, but gives no hint about the word's meaning. Dictionaries may help students to pronounce unfamiliar words if the students know how to use (6) _____and (7) _____. Identification techniques enable students to add words already in their (8) _____vocabularies to their reading vocabularies.

Practice Activity

Use the same set of words which you made for previous exercises and identify structural and phonic elements that might be called to the attention of your students.

Prepare a transparency for three content words. Show the pronunciation of those words by means of three different systems of pronunciation guides.

Further Reading

Shepherd. **Grapho-Phonemic Skills**, pp. 45-48.

Roe, Stoodt, and Burns. **Dictionary Use**, pp. 106-109.

COMPREHENSION

Just as the overall goal of vocational courses is to aid the student to achieve career competence, the overall goal of reading is comprehension. This section of the handbook focuses on comprehension. Even so, it is one of the shorter sections. The reason for brevity is not the relative importance of comprehension but rather the fact that all other topics have received attention only because they are direct contributors to reading comprehension.

General Strategies for Comprehension

This part of the study of comprehension considers some basic principles for promoting comprehension. Questioning, a fundamental technique in the area of comprehension, is discussed and procedures related to questioning are presented. What?

These features of reading comprehension can be helpful to the teacher in planning instruction. The usefulness of the principles has been demonstrated in vocational instruction and in other areas of study. They also provide some of the basis for the procedures presented in the next section of this handbook. Why?

A reasonable and logical answer to the question of how to improve students' ability to learn content from their reading assignment is: "Teach them the skills they need. Make them independent learners." The list of comprehension skills recommended in books on reading instruction sometimes are very long, so long, in fact, that the instructor whose main responsibility is vocational content despairs of having any effect on the students' comprehension in the time available.

Fortunately, almost twenty years ago Olive Niles noted this situation and gave thought to presenting the task as a manageable one. She found that three skills seem to be basic to good comprehension. One of these skills is the ability to set purposes, "to read with adjustment to conscious purpose." Another is the ability to relate the content to the reader's experience; some later authors call this ability "associated reading." Others refer to schema and script. Current slang might mention "put it all together." Another view would be to bring meaning to the reading. The third skill which she noted was the ability to "find and understand thought relationships" (Niles, pp. 2-4). The instructor with limited time can give some attention to one or more of this small group of skills when preparing instruction.

Questions have been and will continue to be one of the most constantly used means of developing comprehension. The reader who is seeking answers demands meaning; he/she is an active learner. To really promote comprehension, questions must be planned. They first must serve the content goals of the subject. In addition, they must fit the background and tap the interests How?

of the student, and guide the pattern of the student's thinking. Again the task may seem too big to tackle for much has been written about questioning in the classroom.

Figure 16 has been prepared in an attempt to provide a summary of the kinds of decisions on questions the teacher makes when planning instruction. It is intended for use somewhat like a shopping list. The teacher refers to it to see if the day's plans include what is needed most.

Thorough discussion of each block of Figure 16 could be so time consuming and tedious that all work on questioning would be rejected. Consequently, only brief comments on some topics are offered.

Setting the purpose for reading-It might be said that having the student set a purpose for reading is inefficient. The instructor knows what the assignment requires and should just tell the student. Both methods will be used at times. Telling the purpose is better than ignoring the subject. Telling is quicker; but may not be more effective. In a career the student will need to ask the right questions and know how to seek the answers.

Time for questions-This is not a "which" decision. All are helpful. It is true that students can keep in mind only a few questions at a time, and some kinds of questions are more appropriate at one time than at another.

Source of questions-Students do need practice formulating questions on their reading, and deciding if the questions fit the text. Students also need to know that the author's questions show what the author considers important.

Level-Literal questions have been much maligned. Understanding exactly what directions say is necessary to survival in business, industry, and the home. The "higher" processes are worthless unless based on fact. Nonetheless, concentrating only on literal questions will interfere with learning.

Practices-Students rarely have an opportunity to explain how they arrived at a correct answer. The opportunity should be offered.

"ReQuest", a prereading procedure developed by Anthony Manzo, is described by Estes and Vaughn (1978, p. 150). This process trains students in purpose setting and in asking productive questions.

ReQuest

The topic of prereading anticipation would be incomplete without mention of the work of Anthony Manzo and his "ReQuest" technique (Manzo, 1969). Like many similar techniques, ReQuest is a

Figure 16

ASPECTS OF QUESTIONING

Purpose	To stimulate interest, set purpose, recall related background	To develop types of thinking	To evaluate results of reading, to expand ideas
Time	Before reading	During reading	After reading
Source	Reader Other students	Teacher	Author
Level	Literal Who? What? When? Where? What kind? How much or how many? Performance of a job will depend on exact literal understanding.	Interpretive What does the statement mean for this job? If . . . then . .? Visualize . . . It is better to visualize the reason for a safety procedure than to test the need for it.	Critical-creative Which would be better . . . According to ULL standards, is this adequate? Under these circumstances, this happended. What might be the cause? The best way to correct it?
Some productive practices	Student questions should carry as much prestige as student answers. Student-student Q's valuable. Give reason for answer.	Call on student after wait. Extend wait time after posing the question to increase quality of response; thinking takes time. Emphasize inquiry rather than evaluation.	Restate the question giving successive cues to establish a line of reasoning or permit discovery to occur.

procedure for getting readers to question before they read and to base their purpose for reading on questions. Unlike many techniques, however, ReQuest has built in a feedback and modeling feature which gives the student needed information. It works something like this:

1. Both teacher and students read the first sentence in the first paragraph of a selection.

2. The teacher closes his or her book and the students may ask any questions they wish related to that sentence. The teacher must answer. Where possible, comments (feedback) regarding question quality are given as well.

3. The students close their books and the teacher now asks any questions he or she wishes. These purposefully include 1) as many as might be useful to the students in terms of information and 2) the kinds of questions that students might emulate when their turn comes again.

4. The procedure is continued through a paragraph or two until students can be expected to reasonably answer the classic purpose question, "What do you think will happen (or be told) in the rest of the selection?"

ReQuest works and is to be recommended for one-to-one and small group teaching. Certainly it is useful for building anticipation and teaching students how to prepare themselves for reading, but there is more to ReQuest than just that. The procedure works, in our judgment, because it provides a chance for feedback and modeling. The students know when what they do is good and have an example of what to do.

Comprehension Skills Important for Vocational Studies

In reading literature there is substantial agreement regarding which comprehension skills are most needed by vocational students. What?

The vocational student needs to:

1. Master technical vocabulary.

2. Follow directions.

3. Recognize and remember the main idea of a passage.

4. Recognize and remember important details and their relation to the main idea.

5. Recognize thought patterns of a passage such as sequence, cause and effect, etc.

6. Interpret graphic material such as diagrams, charts, pictures, and patterns and to visualize processes.

7. Interpret technical materials such as journals, catalogs, and specification lists.

8. Apply technical information to production and to the identification and solution of problems.

The reasons for teaching these skills are obvious-so the student can get on with the job. For many observers, the laboratory appearance of vocational classrooms means that students are always doing and need very little ability to read. Others think that persons who "work with their hands" have no need for reading. These are misapprehensions. In most courses, very careful reading is required, and often the materials are not designed for readability. The "concept density" is very great; that is, a large number of ideas and relationships are packed into a few words, as is true of scientific formulas. In fact, instructors in some areas say freely that they do not use the text. They use worksheets. Worksheets are not as formidable as the text in appearance, but they are not easy reading. No one wants to teach students to pass the course but fail the job. Consequently, school staffs want to give vocational students as much help with reading as possible. How?

Vocabulary has been dealt with earlier. Principles that applied there to building concepts represented by words can be adapted to the more complex concepts into which words are combined-attach new knowledge to existing knowledge, discriminate, and generalize. How

The ability to follow directions-This type of reading is very much like reading math problems. The reading must be done slowly and more than once, for different purposes. For example, the first reading may be straight through to identify the task; next to learn what information is given and what will be needed; then to determine the process step-by-step; next to follow the steps; and finally to evaluate the results. How?

Here are guide questions for the reader of directions to ask (Roe, p. 287).

1. What am I trying to do? (What is the task?)

2. What materials (and equipment) are needed?

3. Do I understand all the words used in these directions?

4. What is the sequence of steps?

5. Have I omitted anything?

6. Am I ready to perform the task?

7. Was I successful in accomplishing the task?

Gwen Flood, a teacher of prevocational students in the Fort Bragg school, described her method for improving attention to oral directions and ability to read directions (CYLUC-W, InService 81, presentation). She assembled materials for making some desirable handicraft-macrame, pottery, house plant, leathercraft. She then distributed written instructions and demonstrated the process once, talking herself through. Students who wished to make a similar object were given sufficient materials for one, but no one was allowed to give any help with the directions. The student who did not follow the directions precisely spoiled the materials and was finished with the project. Mrs. Flood had found this procedure effective with elementary students, secondary students, ESL students, and adults.

Shepherd(p. 123) reports:

> A teacher of photography employed a unique procedure in teaching students to understand directions. The school darkroom contained several pieces of complicated photographic equipment for developing and enlarging pictures and for creating special effects. He first had the students write their own directions for using the equipment. Then he had them read one another's directions and note what parts were incorrect, ambiguous or vague, or omitted. This proved to be an excellent way to teach the students (a) a useful and readable format for directions, (b) the meaning of process words, and (c) precision in language.

The ability to recognize and remember the main idea-
The ability to recognize and remember important details and their relation to the main idea-Sometimes students have negative feelings toward main idea. It sounds so vague. By contrast, they do not hesitate to say, "Shirley never gets the point!" A first step in teaching the recognition of main idea is to use another name for it.

Say: List the facts in this passage on separate lines. How? Choose the one line that has the broadest meaning.

Look for a sentence in this paragraph for which the other sentences give supporting evidence.

If these sentences were in a list, which one would be more like the title of the list?

One reason students are prone to miss the main idea is that details are often more concrete and therefore more interesting than the main idea, which must be more general. In courses designed to teach a student to do something, knowing the main

point of the material is quite important. Certainly, the main idea gives the student an organizer for helping to remember. It is like a file label for a portion of the student's information stock.

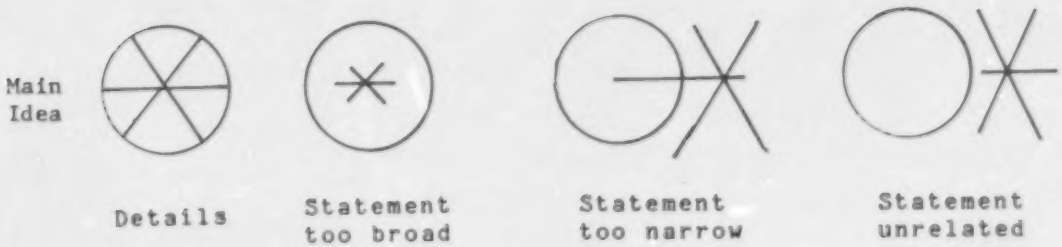
Texts and teachers often speak of teaching the main idea, and then speak of teaching students to look for significant details. It is probable that comprehension is better served if the main idea and important details are studied simultaneously. It is necessary to know the main idea in order to determine which details are important. Identifying the main idea and details is one of the "thought relationships in a passage" which Niles gave in the list of essential reading skills discussed above.

The task of recognizing the main idea of a passage is much easier when the main idea is directly stated than when it is not stated. Procedures for identifying main ideas are similar whether the passage is one paragraph or several.

For helping students to identify main ideas the wheel analogy in Figure 17 is useful. This illustration appeared in Film Five, "Developing Comprehension Skills," of the Syracuse University Series **Teaching Secondary Reading.**

The following symbols are displayed.

Figure 17



The sentences of a passage are compared to the rim (main idea) and the spokes (details). Note that the rim just fits the spokes. The comparison helps students understand why their choices are right and why they are wrong. The wheel can also be used to check the adequacy of a main idea statement which had to be composed by the student.

Three other procedures are sometimes useful for teaching main idea and details when there is no direct statement of the main idea in the passage.

1. Try to tell me in two words what this passage is about (what it says).

2. Try to state the message of this passage in six words.

3. Send a telegram. Here the student underlines a few key words in each sentence of a passage. Then the student tries to compose a sentence using the key words.

This discussion of ways to teach students to recognize the main idea and significant details of a passage has left out, "What would be a good title for this story?" The omission is intentional. Often an excellent title does not express the main idea. Teachers should resist poor instructional practices, no matter how long they have been around.

A cogent illustration of a title being an excellent label but not a main idea is, "The Seven Danger Signals of Cancer." The posters would be worthless if the public did not think, "Watch for these and get immediate attention if any one occurs."

The difficulty of reading material for electronics has been recognized by Charles F. Hunter who has prepared a workbook **Reading for Main Ideas and Details in Electronics.** In the introduction he points out a number of difficulties encountered in electronics materials. He describes writing in the field as being, "jammed with facts and information . . ." and different from the writing in traditional school subjects. He feels that to truly master assigned materials in electronics the student must be skilled in identifying the main idea. According to his account, topic sentences are rare and the main idea is found in a number of sentences which have to be combined in order to understand the main idea clearly (Hunter, p. 1). One of his exercises is in Appendix I-Q.

Ability to recognize the thought patterns in a passage-As Hunter said about the main idea in electronics, in most vocational subjects the student must be skilled at recognizing the thought patterns in a passage. Success depends not only on understanding the meaning of the words but on knowing the relationships among those meanings. There are many ways expository material can be organized. But as Niles pointed out (p. 2) four patterns or combinations of them can account for most writing. The patterns are:

1.	Simple list	(Category)
2.	Time order	(Sequence)
3.	Cause and effect	
4.	Comparison and contrast	

How?

Training students to look for these patterns gives them an advantage in perceiving thought relations and, therefore, in understanding the text.

The search for patterns is aided by the fact that certain words are typically used with these patterns. Herber (1978, p. 79) presents a list compiled by Vacca which is as follows:

> Cause/effect: because, since, therefore, consequently, as a result, this led to, so that, nevertheless, accordingly, if . . . then.

Comparison/contrast: however, but, as well as, on the other hand, not only . . . but also, either . . . or, while, although, unless, similarly, yet.

Time order: on (date), not long after, now, as, before, after, when.

Simple listing: to begin with . . .: first . . . second . . .; next; then; finally.

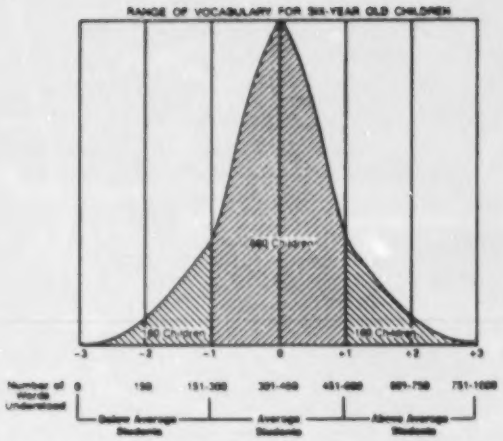
A more comprehensive list of pattern signals from David Shepard is in Appendix I-P.

The ability to interpret graphic material such as diagrams, charts, pictures, and patterns and to visualize processes-All modern texts use graphic aids-diagrams, charts, graphs, tables, pictograms, pictures, drawing, and flow charts. These devices appear more frequently in vocational texts than in texts of some other subjects.

Often graphic presentation can clarify ideas and relations among those ideas more effectively than printed language can. Graphic illustrations are a means of compensating for difficult readability. It sometimes happens that graphic material merely increases the problems the student encounters. This is true if the accompanying explanation is inadequate or written in very difficult language. Some texts intended for poor readers defeat their purpose. They contain so many graphic "aids" that the pages become cluttered, and the main points contained in written text are difficult to locate.

A graph (Figure 18) from **Exploring Careers in Child Care** (McFarland, p. 62) is shown. The normal-curve concept of the graph seems questionable for a junior high text for less able students. The statement under the graph falls in the invalid (difficult side) area of the Fry graph. The use of above those two lines in the text when between these two lines makes the sense which is intended creates another difficulty. Can this graphic aid aid?

Figure 18



This graph shows the reading ability of 1,000 six-year old children who represent the 3,000,000 six-year-olds in the United States.

McFarland, **Exploring Careers in Child Care**, p. 62.

Study the graph depicted to the left. Find the line marked-1. Find the line marked +1. The area above these two lines represents the 680 children who understood between 300 and 600 of the 1,000 words presented in the test. This is the average group of children.

What about the other children? By studying the graph, you can see that the remaining 320 children of the 1,000 tested are outside the average category. These 320 children are either above or below average. These are considered the special children. By their above average or below average scores, they have shown that they have special needs. Billy understood 350 words in the test. Where would you place Billy between the -1 and +1 lines of the graph? Mary understood 700 words. Near what line on the graph would you place her?

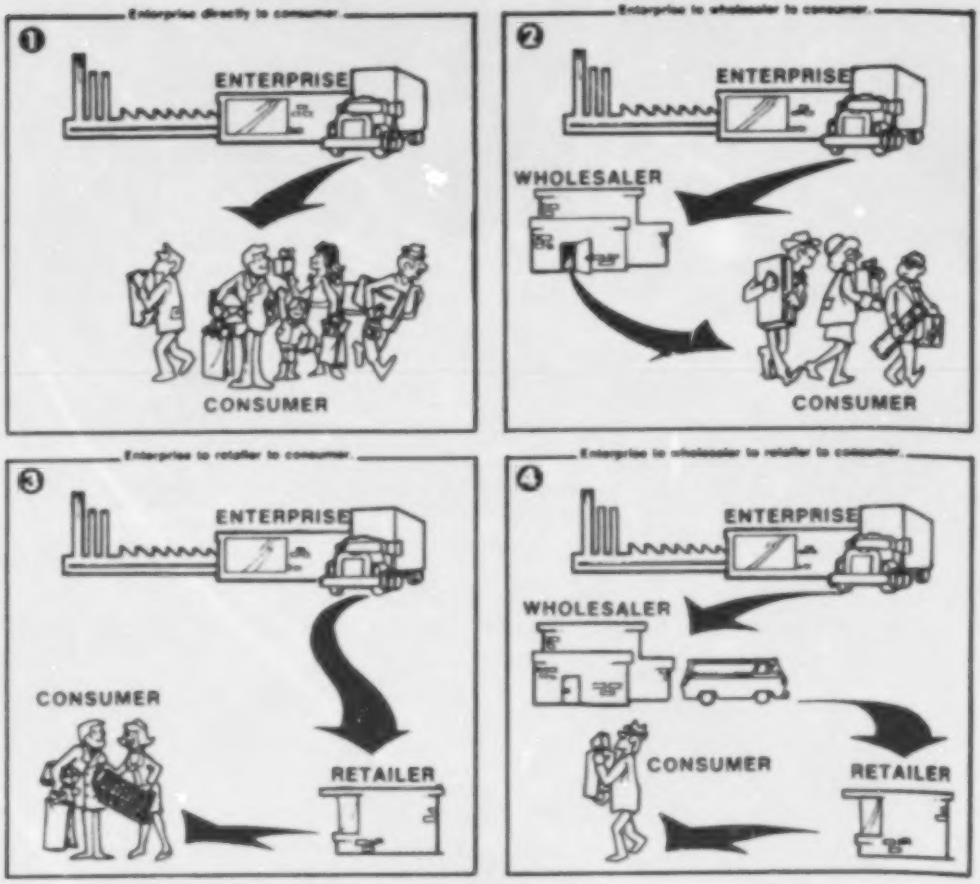
Figure 19 "Distribution Channels" also is accompanied by difficult text. It could, nonetheless, be very helpful to the teacher who was providing oral explanation of the concepts enterprise, consumer, retailer, and wholesaler.

Examples of textbook exercises showing students how to follow directions and read diagrams and charts are shown in Appendices I-R, I-S, and I-T.

Figure 19

McFarland, **Exploring Careers in Child Care**, p. 188

DISTRIBUTION CHANNELS



There are four basic ways for the enterprise to get its product or service to consumers. Each way is a channel of distribution. The channel selected is decided by the distance between the enterprise and consumer, the cost, how often production takes place, and the amount produced.

For each area the teacher must analyze the kinds of graphic aids used and plan explanatory instruction. The questions below are intended to assist in the study of graphs and tables, but they are adaptable to other graphic forms. Students should ask themselves:

1. What is the title? Titles may be long and complex.

2. What units are represented? A unit may be a group.

3. How do quantities or classes change in each direction? The directions usually represent differences.

4. What changes or differences are shown?

5. What other information can I find from this graph (chart, table)?

The ability to interpret technical materials such as journals, catalogs, specification lists-Every field has some specialized literature. This literature includes trade magazines and hobby-type publications as well as government bulletins, catalogs, and product assembly directions. Some are dry references, very compactly written. Others carry all the appeal Madison Avenue can create.

All should be a part of the vocational student's orientation to the trade. Items such as metrics charts are necessary for success in the course. Items such as trade and hobby magazines increase background and motivation. Just as mastery of "in" technical vocabulary boosts student morale, being conversant with the literature of the trade gives the student a sense of belonging to a prestige group.

What was said in Section I about showing students how to get the most out of their texts applies to trade literature. In magazines, students should be shown the usual make-up. Their attention should be directed to special features and to services provided, such as lists of free products and special student rates. Smaller items such as brochures and charts can be displayed on bulletin boards. Articles and booklets can be stapled in folders for the classroom reading shelf. How?

Shoptalk is a series of workbooks for learning vocational reading skills. Appendices I-U and I-V show exercises from **Agriculture** and **Electricity** for which the student uses the actual technical materials of those fields.

The ability to apply technical information to production and to the identification and solution of problems-This skill is fostered when the vocational instructor periodically assigns projects and problems which can only be completed by reading technical materials. The activities must be ones the student has had no opportunity to observe. How?

Self-Check on Comprehension

1-3. In this discussion the three most important comprehension skills students should be taught are:

_____

_____

_____

For 4-7 circle the letter with the best response.

4. According to the discussion in the preceding section, wait time should be:

   A. less than is customary in most classrooms.
   B. about the same as is customary.
   C. longer than is customary.
   D. used for independent learning activities.

5. According to the preceding discussion:

   A. instructors should ask questions for students to answer.
   B. students should ask questions for instructors to answer.
   C. students should ask questions for students to answer.
   D. students should ask questions for themselves to answer.
   E. All of these combinations can be helpful.

6. Choose the statement below which is <u>not</u> supported by the foregoing discussion.

   A. To maintain an atmosphere of spontaniety, instructors should mostly use questions formulated during class discussion.
   B. Questions beginning with "What if . . ." usually require a level of thinking that is higher than literal.
   C. Instructors should call students' attention to the "5 W's and How." (This expression has not been used. Inference and teaching background determine the choice.)
   D. Asking questions that are on the literal level is a waste of time.

7. ReQuest stands for:

   A. requesting information.
   B. reciprocal questioning.
   C. restating questions so as to direct student thinking.
   D. review in search of answers to questions.

8-9. After each of the sentences below, write the organizational pattern you would expect.

   These things are wrong with my bookcase _____

   As Ruth entered,she picked up her apron; then she . . .

10. Writing in telegraph style helps to state the _____.

Practice Activities

1. Choose a short passage from your text. Write two or more questions on directly stated facts. Write one or more that require the student to infer answers that are not directly stated.

2. Make up a worksheet to give practice in interpreting one kind of graphic presentation used in the text.

Further Reading

Herber, H. L. and Nelson, J. B. "Questioning Is Not the Answer," **Journal of Reading**, 18, pp. 512-517. In Dishner, Beam, and Readance, 1981, pp. 80-85.

Smith, S. J. **Comprehension**, pp. 38-40; **Critical and Creative Reading**, pp. 41-43; and selectively, **Teaching Reading in the Content Areas**, pp. 51-70.

PART III: STRATEGIES FOR IMPROVING READING DURING CONTENT INSTRUCTION

THE DIRECTED READING ACTIVITY

The directed reading activity is a five-step plan designed to aid the instructor in developing a reading lesson from a content area textbook. This plan is especially helpful when working with slow and reluctant readers. This plan includes activities to be done both before and after reading and is designed to be used in a group or entire class situation. The phases of the directed reading activity are (1) preparation, (2) silent reading, (3) developing comprehension, (4) rereading, and (5) follow-up.

Before beginning the directed reading activity, the instructor must analyze the content of the material to be studied to decide what key concepts, generalizations, and new vocabulary the students are to gain from the lesson. It is important to note here that if a selection is very long, it may be necessary to divide it into parts and teach each part separately. Once these tasks have been done, the directed reading activity can begin.

Self-Check on What a DRA Is

1. What is a directed reading activity?

2. List the five steps of a directed reading activity.

3. What must the teacher do before beginning a directed reading activity?

In the preparation phase of the directed reading activity, the students are prepared for reading. Initially the instructor must establish the background necessary for the students to successfully comprehend the lesson. Information needed to provide an adequate background must be given and any misconceptions about the topic must be corrected. This assistance can be in the form of teacher given information, visual aids, group discussions, or guest speakers. The instructor must be careful, however, not to give so much information that the students will no longer have a need to read the lesson. Instead, the background information should be designed to motivate the students to read further.

Along with background information, new vocabulary should be introduced during the preparation phase. Any new words that are important to the lesson should be discussed in terms of pronunciation and meaning. Words that can be figured out from the text of the material need to be omitted because students should be encouraged to use context clues in reading. It is best to limit the essential vocabulary to as few words as possible so students will not be overwhelmed. (A more in-depth discussion of developing vocabulary is provided in an earlier section of this handbook.)

Setting purposes for the reading selection is also part of the preparation phase. This task may be done by the instructor alone; or the instructor and students can work together. In either case, purposes must be set in terms of the students' background and the desired understanding of the material. Questions and outlines are just two of the ways by which this can be accomplished.

Previewing the material with the students and making suggestions about adjustments in reading is also part of the preparation phase. When previewing the material, the instructor guides the students in discovering the organization of the material by looking at introductions, headings, sub-headings, paragraphs, diagrams, graphs, maps, pictures, summaries, and questions. Skimming for an overview of the material and scanning for previously discussed vocabulary can also be done. At this time, the instructor can make suggestions about reading rate, such as skimming some areas for a general idea and reading other sections more carefully for important facts.

Finally, a very important part of the preparation phase is the attitude of the instructor. If the students are to be properly prepared and motivated for the lesson, the instructor must show enthusiasm and a positive attitude toward the subject matter.

Self-Check on Preparation in a DRA

1. Why is background information necessary before beginning the directed reading activity?

2. What should be considered when choosing the important vocabulary for the reading lesson?

3. Why is it important to set purposes for the directed reading activity? List what should be considered when setting the purposes.

4. What is accomplished by previewing the material?

5. Discuss why the instructor's attitude is a very important part of the preparation phase.

The next phase of the directed reading activity is <u>silent reading</u>. In this phase, the students read the selection using the reading adjustments suggested and looking for the purposes previously established. The entire lesson should be read before a discussion takes place. If it is at all possible, make provisions for lower reading levels by taping the selection, rewriting it, or by having an able reader read to poorer readers. It is also very helpful if the silent reading can be done partly in class because this provides an opportunity to give individual

help to students who may have a question or have difficulty in reading. Also, students who have a tendency not to complete assignments are often encouraged to do so when they are provided with the opportunity to begin the assignment in class.

Self-Check on Silent Reading in a DRA

1. How can provisions be made for lower reading levels?

2. Why is it important for most silent reading to be done at least partly in class?

Developing comprehension is the third phase of the directed reading activity. In this phase, the selection should be discussed in terms of the purposes which were established before reading. The discussion should be informal and the instructor should try to avoid the question and answer method although it may be necessary to ask some motivating questions to stimulate the discussion. In this phase, ideas are discussed, facts stated, conclusions drawn, and the importance of the material is evaluated. During the discussion, the instructor is able to see where comprehension may be faulty and use this opportunity to clarify the confusion by further developing the concepts and vocabulary. The instructor can use this time to assist the students in recalling the facts and to determine if there is a need for further information from both the text and other sources. At this stage outside material that is of high interest to the students may be helpful; however, the instructor must make certain that any outside reading material used is written at the students' reading level.

Self-Check on Developing Comprehension in a DRA

1. Why is a discussion of the material important in terms of developing comprehension?

2. List what should be covered in the discussion phase.

3. Even though the "question and answer" method should be avoided, when might questions be helpful in the discussion?

The fourth phase of the directed reading activity may be rereading. This is sometimes necessary to further clarify the information and concepts just discussed, to locate difficult vocabulary, or to verify statements of fact. Students should know the purpose for rereading. Rereading may be silent or oral; and it may involve rereading certain parts or the entire selection. Rereading may not always be necessary and the decision whether or not to reread is made by the instructor. (Caution should be taken not to engage in round robin reading.)

Self-Check on Rereading in a DRA

1. Why is rereading sometimes necessary?

2. What forms may rereading take?

The last phase of the directed reading activity is the follow-up. In this phase students make use of the ideas gained which is really what reading is all about. Here the skills and concepts learned are reinforced, extended, and applied to the practical areas of the students' education. This can be accomplished by setting up problems requiring further information or by actual problem solving activities. Different lessons within a given content area, as well as different content areas, will lend themselves more easily to certain follow-up activities than others; therefore, the specific objectives for a given lesson must be considered when planning the follow-up phase.

Self-Check on Follow-up in a DRA

1. What is the purpose of making use of the ideas gained from reading?

2. How may the instructor provide opportunities for students to put their ideas to work?

Reading is a basic and very important part of every content area and the success of the students depends largely on how competent they are in the language of the subject being taught. For this reason, the directed reading activity is a very helpful and important tool for all content areas. Regardless of how much time is spent in actual lab work in a given content area, some theory must be taught from the textbook. For this reason, a content area teacher must use every opportunity to develop reading skills which are necessary if students are to achieve the ultimate objectives in the content area. Although it is true that a content area teacher is not expected to be a reading teacher, it is necessary to teach those skills which are needed for success in a particular subject area. The content area teacher must help students refine their reading skills and transfer the specific skills needed for success to specific content areas. The directed reading activity provides the means by which these things can be accomplished. Why?

The directed reading activity also provides a means of establishing purpose and motivation for a lesson and every teacher knows that students must want to learn if they are to achieve anything from their reading. Student motivation is heightened if the students know why they are reading a lesson and what they are to get from it. Every teacher has heard at some time, "I don't see why I have to read this; I'll never use it!" The directed reading activity gives each teacher the opportunity to show the students the reason that the material is important to learn and the manner in which it can be used.

Comprehension in reading depends on what the students already know and how it can be applied to what they are reading. If students do not have enough background information to understand the new material being read, then comprehension does not take place and nothing is gained from the lesson. Again, the

directed reading activity provides the opportunity for the instrutor to supply the background information necessary for successful reading of the material. However, even when students understand what they read, a high percentage is forgotten within a few hours. This can be minimized if students have the chance to discuss the material they read; the directed reading activity provides a discussion phase which can help students fit new material into their existing framework of information. The demonstration of comprehension is applying knowledge gained to new situations and this is also a part of the directed reading activity.

Overall, the directed reading activity provides for active involvement of the students in all phases and students must be actively involved to learn.

Self-Check on Why the DRA Should be Used

1. Why do content area instructors need to be concerned with teaching reading skills?

2. How can the directed reading activity aid content area instructors in developing lessons from textbooks?

Further Reading

Herber, pp. 213-233, especially "Instructional Framework and the Directed Reading Activity," pp. 226-229.

Smith, S. J. "Sequence of the Content Area Reading Lesson: The Directed Reading Activity," pp. 53-55, "Directed Reading Activity," pp. 92-95.

Examples of directed reading activities for various areas of vocational education follow.

Directed Reading Activity - Prevocational Education
"Lettering and Dimensioning"

Background Information

Point out to students that all industrial drawings contain lettering; therefore, lettering is very important because it affects the appearance of the work. Show students examples of different types of lettering and examples of good and poor lettering to illustrate the effect of lettering on the drawings. At this point the important vocabulary should be introduced and discussed in terms of pronunciation and meaning. The vocabulary for this lesson should include 1) dimension, 2) gothic, 3) simplified, and 4) staggered.

The purposes of the lesson are to acquaint the students with the kinds of lettering used on drawings, how letters and numerals are constructed, how drawings are dimensioned, and what simplified drafting is.

In previewing the material, the instructor should point out the headings, diagrams, and quiz at the end of the lesson, and the questions could be read aloud to clarify purposes for reading. The students should also be instructed to read carefully for information about the construction of letters and numerals and to pay close attention to all the diagrams in the lesson.

Silent Reading

It would be very beneficial if this lesson could be read in class so that the instructor could be available to explain and answer questions about the diagrams in the lesson.

Developing Comprehension

The lesson should be discussed in terms of the purposes set after everyone has completed the reading. From the discussion, students should show that they have understood what they read. They should have learned the four items set forth in the purposes and show that they know the new vocabulary. During the discussion, the instructor can clear up any misconceptions the students may have and, from the outcome of the discussion, the instructor can decide whether rereading is necessary. Some parts of the lesson may need to be clarified with oral reading or perhaps the entire selection will need to be reread.

Follow-up

The students could be given drafting activities such as the following.

1. Divide your plate into four sections.

2. Letter 1/8 inch alphabets and numerals in section A. Allow 1/8 inch between lines.

3. Use horizontal guide lines, and vertical or inclined guide lines.

4. Refer to your lettering charts when lettering.

5. Instructor will tell you when to letter the other sections.

6. Study the alphabet of lines as it pertains to dimension lines, extension lines, and leaders.

7. Dimension and letter drawings you have already completed.

Directed Reading Activity - Home Economics Education
"Take Good Care of Your Clothes"

Background Information

The instructor should discuss why it is necessary to have well cared for clothes and how it relates to overall grooming. Show pictures from magazines, etc., of well groomed and not so well groomed people and discuss how poorly cared for clothes could spoil an otherwise well groomed appearance. Deal with the misconception that "nice" clothes mean expensive clothes and show that a person can be well dressed on a limited budget.

The important vocabulary to be discussed includes 1) hues, 2) "swish bags", 3) nylon, 4) orlon, 5) dacron, 6) permanent press, and 7) durable press.

The purposes of the lesson are to familiarize the students with the fact that garments should be washed separately; how to launder underwear, sweaters, socks and stockings; how to remove grease spots, fruit stains; and to know when to remove spots.

When previewing the lesson, point out the main headings of paragraphs, locate the italicized words, and look at the pictures and diagrams. The students should also be instructed to read carefully for detail and to pay close attention to diagrams and pictures, making certain to read all the captions.

Silent Reading

Silent reading may be done partly in class, entirely in class or for homework.

Developing Comprehension

Again, as in every directed reading activity, the lesson is discussed in terms of the purposes set and a decision is made about rereading.

Follow-up

These are just some of the extension activities which could be used with this lesson.

1. Provide swatches of stained material and have students remove stains properly. (Also, provide some fabric which has been improperly treated.)

2. Have students give demonstrations on washing various items of clothing such as wash and wear shirt, wool sweater, socks, underwear, etc.

Directed Reading Activity - Distributive Education
"Getting Paid"

Background Information

Earlier chapters on choosing a job, duties required, company policies and benefits, and other aspects related to choosing a job should be discussed. Review salary, chances for salary increases, and types of benefits which can be offered in addition to pay (i.e. matters such as profit sharing, insurance, paid vacations, holidays and retirement plans).

The important vocabulary for this lesson should include pay rate, deductions, commission, gross pay and take-home pay.

The students should read to know the relationship between big ticket items and commission, the commission rate most common for employees compensated by salary plus commission, what deductions can be taken from a paycheck, and what items can be included in fringe benefits.

In previewing the lesson, the instructor should direct the students' attention to the paragraph headings, the math problems illustrating the concepts, the pictures and diagrams, and the author's questions (which could be read aloud for further clarification of the purposes). Students should also be instructed to read carefully for details, paying close attention to all math problems.

Silent Reading

Depending on the students' needs, this may be done in class, for homework, or begun in class to be completed at home.

Discussion

The lesson should be discussed after reading in terms of the purposes previously established and a decision about rereading should be made based on the students' understanding of the material.

Follow-up

For this lesson, students could make a chart listing various types of businesses (supermarket, department store, service business, etc.) giving the most common method of paying employees, reasons for their answers, and the source of their information.

A math problem such as the following could also be used.

A furniture salesperson works on salary plus commission with a draw. His/her salary is $150 per week plus a commission of 1.5% on sales. Last week he/she sold $8,350 and drew $125 against

his/her commission. Figure a) gross pay, b) actual commission, and c) if any adjustment will need to be made in next week's salary. If so, what?

Directed Reading Activity - Agriculture Education (Forestry)
"Felling"

Background Information

Students should be reviewed on the selection of a proper chain saw for the type of job to be done, and the techniques for the safe use of a chain saw should also be discussed. Stress that the lesson is important because felling calls for more skills that any other operation in harvesting.

The important vocabulary includes skidding, diameter and undercuts.

The purpose of the lesson is to teach the students to employ numerous cutting methods suited to the size and the condition of the tree taking into consideration 1) the lean of the tree, 2) other trees in the area, 3) the slope of the ground, 4) presence off snags, and 5) direction for skidding. The students should also learn how undercuts and backcuts should be made and how to decide on the direction in which trees should fall.

When previewing this lesson, the instructor should guide the students through the diagrams which illustrate important points in felling trees. The students should be instructed to read carefully for information and told to pay close attention to all diagrams.

Silent Reading

It would be helpful if this lesson could be read in class so that the instructor would be available to explain the concepts if needed.

Developing Comprehension

Discussion is especially important in this lesson to make certain that all students understand the felling procedure completely before progressing to the follow-up activities. At this point, the decision about rereading is made.

Follow-up

After all the students have gained a full understanding of the lesson, the students can gain experience by learning to cut small diameter trees and gradually working up to larger ones.

Directed Reading Activity - Health Occupations Education
"Role of the Health Assistant"

Background Information

Some historical background can be given, such as the fact that since recorded history, people have had nursing care. Review with the students that nurses plan the nursing care of patients based on physician's orders and the nurse is assisted by a technical nurse, an LPN (licensed practical nurse) and trained health assistants.

The important vocabulary should include malpractice, intravenous, medicolegal, and infusion.

The purpose of this lesson is to teach the students to identify the nursing team, know the proper dress, understand the responsibilities of the medical assistant, and to be able to recognize medicolegal situations and be able to take the proper course of action.

When previewing the lesson, discuss the headings to paragraphs and point out the words and phrases in italics, as well as pictures, graphs, summary, and review. Students should be instructed to read carefully for detail and pay especially close attention to the chart of the duties of the health assistant.

Silent Reading

This lesson could be read partly in class or done entirely for homework.

Developing Comprehension

The discussion should be in terms of the purposes and the decision to reread should be made based on the needs of the students.

Follow-up

Some activities which could be used with this lesson are:

1. Have the students discuss the importance of good grooming in terms of the patient's opinion of the hospital and co-workers' opinions.

2. Have small groups report on the responsibilities of the medical assistant in given situations. Example: The patient asks the medical assistant to write a will; the medical assistant sees a co-worker stealing.

3. Have students make a chart showing the lines of authority the medical assistant follows.

Directed Reading Activity - Business Education (Clerical Occupations)
"Handling Outgoing Calls"

Background Information

The instructor should review basic telephone procedures such as courtesy, effective telephone voice, taking messages accurately, speech, etc. (Some good and bad examples of each of these procedures would be very effective.)

The important vocabulary includes expeditiously, consult, categories, and advisable.

The purposes for this lesson are to familiarize the students with different types of telephone directories, to help them understand the purpose of the personal directory, know when the yellow pages could be used, where to find information in the directory and making emergency calls, know the differences between person-to-person and station-to-station calls, know the importance of time zones, and know how to figure charges for long distance calls.

When previewing, look at the title, paragraph headings and subheadings, the important vocabulary in red, the time zone map, the chart of charges for long distance calls, and the questions at the end of the chapter. Direct the students to read carefully for facts and skim the charts.

Silent Reading

This lesson should at least be started in class so questions or misconceptions could be cleared up by the instructor.

Developing Comprehension

When the reading is completed, the lesson should be discussed to determine the level of understanding achieved by the students and the decision to reread should be made.

Follow-up

These are some activities which could be used with this lesson.

1. Role Playing - The secretary is in the office and a co-worker falls and injures his/her foot. The injury is quite painful and the person is unable to stand. The supervisor asks the secretary to call the hospital and arrange for the worker to be seen. Have one student play the secretary making the call and another play the receptionist at the hospital. The class can then discuss the role playing, pointing out the things done correctly and making suggestions as to where improvements could be made.

2. Have students find what types of phone directories are provided by the local telephone company.

3. Have students answer the following questions using the local directory and yellow pages.

   a) The number to call to report a fire
   b) The number for the police
   c) Under what heading you could locate a lawyer
   d) Under what heading you could locate a physician
   e) The heading under which you could locate a source for typewriter ribbons

4. Using the rate table for long distance calls in the text, have students figure the following rates.

   a) Monday, 5:20 p.m., 4-minute call from New York to Houston
   b) Wednesday, 9:40 a.m., 7-minute call from Washington, D.C. to New Orleans
   c) Saturday, 6:50 p.m., 5-minute call from Boston, Mass., to Miami, Fla.

Directed Reading Activity - Trade and Industrial Education (Machine Shop)
"Learning to Read a Working Drawing"

Background Information

Review how drawings are used in the shop area (i.e., The drawing tells what kind of material to use, how large each part is, the shape of each part, what the finished product will look like, etc.) Point out that the most commonly used drawing is the working drawing and show some examples of drawings.

The important vocabulary consists of axis, symmetrical, designated, specifications, tolerance, and interchangeable.

The purposes for this lesson are to teach the students to know the differences in the extension line, center line, object lines, section lines, hidden lines, cutting plane lines, and break lines. Students must understand the importance of scale size and dimension and be able to use abbreviations, notes, and symbols. The students should know the steps for constructing a shop sketch and be able to construct one.

When previewing this lesson, look at section headings, detailed drawings, the italicized vocabulary, and the outlined procedures. Instruct the students to skim the information first to get a general idea of broader concepts, then read carefully for vocabulary and facts, paying close attention to drawings which illustrate the procedures described.

Silent Reading

This lesson should be read in class if at all possible so that students will be able to ask questions that may arise as they read.

Developing Comprehension

The lesson should be discussed in terms of the purposes previously stated and any misconceptions should be cleared up as they arise. Based on the level of understanding the students have achieved, the decision to reread can be made.

Follow-Up

The students could be given several types of drawings and asked to identify the various lines (section, center, etc.), the dimension, scale, etc. of the drawing. Also, have students construct their own shop sketches of projects that they wish to make in the lab.

Directed Reading Activity - Trade and Industrial Education
(Textiles)
"Warping"

Background Information

Review the process of commercial weaving, discussing the necessary preparations for weaving (warping and slashing) to see how warping fits into the overall scheme. Show examples of different types of woven fabrics, pointing out the warp yarns in each fabric.

The important vocabulary includes warp, warp yarn, spindle, creel, calculation, selvage, warp ticket, and cheeses.

The purposes for the lesson include understanding the purpose of the warping process, knowing the three steps involved in the warping process and being able to perform them, knowing the three types of packaged yarn, and knowing the purposes of selvage.

When previewing, look at section headings, photos, and captions. Have students scan the material for an overview of the general concepts, then read carefully for specific facts, paying close attention to the photos and captions.

Silent Reading

This lesson could be read in class or for homework.

Developing Comprehension

Discuss the lesson and determine if any reading should be done.

Follow-up

Have the students identify warp yarn in several types of woven fabrics. Show the students examples of packaged yarn and have them identify their types. Have the students prepare the yarn for the warper creel, calculate the warp ends, prepare section beams, and determine the selvage.

STUDY GUIDES & SQ3R

Study Guides

Study guides are often very helpful in providing students with the direction and guidance needed in a content reading lesson and can easily be used within a directed reading lesson. Although there are no standard forms for study guides, there are five general steps that need to be followed when constructing study guides. What? Why?

First, the instructor must analyze the material for content and decide what information needs to be emphasized. Next, the material must be analyzed for process, such as how the material is organized, what the students will do with the information, and what reading skills are necessary to successfully complete the assignment. After the material has been analyzed, the instructor must then decide how much assistance should be provided for students in the class. The students' competencies, the degree of difficulty of the material, and the level of understanding required must be considered. The fourth step is the actual construction of the guide. The guide will reflect all the decisions the teacher made about the material in the first three steps. Finally, the study guide is used in the context of a well planned lesson, such as with the silent reading step of the directed reading lesson. Study guides, however, should never simply be given out to the students. The instructor should always show the student how to use the study guide. How?

Self-Check on Steps for Constructing a Study Guide

What are the five general steps which need to be followed when constructing a study guide?

It is important to avoid crowding too much print on the page of a study guide because this tends to overwhelm students, especially the poorer readers. The study guide must reflect both the content and the process of the lesson to be studied. The instructor should make the study guide different as well as difficult. The students should be required to locate, verify and, in general, manipulate the material so that they are active participants in the assignment.

Study guides should not be used with every reading assignment; instead they should be reserved for lessons that need careful reading. It is important to note that study guides must not be graded for their purpose is to teach; however, the study guide should be checked and discussed when completed. This allows the students to receive immediate feedback on their work and adjustments can be made as needed. Correct answers for the guides may be provided in many ways such as a checksheet, class discussion, or discussion within groups.

It is a good idea to allow students to begin working on the study guide in class with other students and complete the guide on their own. In this way students may help each other and the instructor is also available to answer any questions or help those students who may have problems.

Self-Check on Qualities and Use of Study Guides

1. What should study guides reflect about the material to be studied?

2. When should study guides be used?

3. Why is it helpful to allow students to begin working on the study guide in class?

Further Reading

Lee. "Dealing with Reading in the Industrial Arts," Journal of Reading (May 1981), pp. 663-666.

Smith, S. J. **Process Guides** and **Reading Guide**, pp. 89-91.

SQ3R

A generalized procedure like a study guide which can be used in conjunction with the DRA is the SQ3R formula. This is Survey, Question, Read, Recite, and Review. The formula is to be taught to the students, after which they apply the study formula to the text and work independently. Many students will find this procedure extremely helpful and will be able to use the formula successfully. However, the slow and reluctant readers will need assistance. The instructor should work through the steps with those students in small groups or even as a class, depending on the needs of the students.

Here are the steps of the SQ3R textbook study skills formula in more detail.

Step 1 - Survey

Look over the entire assignment. Read the headings, sub-headings, and summary, if the chapter contains these. Try to get the general ideas of the whole lesson. Details can be placed later into the framework you have in mind and the whole lesson will mean more to you.

Step 2 - Questions

Think of questions which are likely to be answered in the lesson. Headings can often be turned into questions. If any heading does not give you a clear idea of what question is to be answered, use this question: What does the author expect me to learn about this from studying this section?

Step 3 - Read

Study the lesson to find the answers to the questions, but do not stop to read every word carefully; concentrate on finding the main idea. You cannot remember all the facts you find, so look for the important ones. Do not pick out too many facts and do not try to memorize the facts at this point.

Study Guide- Fold a sheet of large-sized notebook paper lengthwise, down the middle. On the left list the topics discussed in the book. Leave space between the topics.

When you have finished reading a section and picking out one or two points to remember, list the key words on the right. Do not do this until after you have read the section and thought about it. This is the most important part of your studying, and you cannot tell what is important until you have read all the facts.

Step 4 - Recite

Go back over the lesson immediately. Cover the right hand side of your paper and check the headings on the left. See if

you can remember what that section was about. If you cannot, you will have to look at the key words; or you may even have to go back to the book in order to restudy certain parts. This step is very important. By going over the material immediately, you will help prevent forgetting.

Continue to practice until you can recite the entire study guide without referring to the key words; then practice some more.

Step 5 - Review

Some time later, and also before a test, go back to your headings and questions again and test yourself. You will need to reread only the parts which you have forgotten; if you have taken the first four steps seriously, you will find that you do not have very much to restudy.

Self-Check on SQ3R

1. What does SQ3R mean?

2. How is this formula basically to be used?

3. How may modifications be made to use this formula with slow and reluctant readers?

Immediate and frequent knowledge of results is motivating to students and the study guide can be a means of providing this stimulus. Once the guide has been completed, the students can be supplied with the correct answers against which they can check their study guides and thereby receive immediate feedback. Also, a study guide gets students' understanding to as high a level as the nature of the material and the students' ability will allow.

Examples of study guides for various vocational areas follow.

Study Guide - Business Education (Clerical Occupations)
"Photocopying"

1. List 5 features which photocopiers have.
   a)
   b)
   c)
   d)
   e)

2. Name the 2 main types of photocopiers and list the differences between them.

3. Give 2 brand names of photocopiers.
   a)
   b)

4. Explain why photocopiers are important to offices.

5. Explain the differences between electrostatic and infrared copiers and decide which would be more practical for an office which makes many copies. Give the reasons for your answer.

6. From the descriptions of the different types of photocopiers given in the text, decide which copier you would choose if you were buying one for an office where you were employed. Explain your answer.

Study Guide - Health Occupations Education
"Medical Ethics"

1. Pg. 15, sentence 2 in the summary. This sentence states the main idea of the lesson. Change the main idea to a question.

2. Pg. 14, sections 2 and 3 define preservation of life and confidential information. Do not read further until you are sure of these two points.

3. Pg. 15, paragraph 2. Use this paragraph to help you complete this statement. An assistant should not accept a tip because

_____

4. Pg. 15, paragraph 3. Using this section as reference, write a short paragraph discussing the special needs people from different faiths might have.

5. Pg. 15, paragraph 4. This paragraph summarizes the section. Read it slowly; if there is anything you do not understand, go back to the reading and check it over carefully.

Study Guide - Distributive Education
"Handling an Interview"

1. Tell why it is important to apply in person for a job.

2. List at least 5 questions which you should be prepared to answer on an interview.
   a)
   b)
   c)
   d)
   e)

3. Define the following:
   a) Personal data sheet

   b) Personnel

4. Explain the purpose of preparing a personal data sheet and describe how it could help you when applying for a job.

5. Discuss appropriate and inappropriate dress for an interview and explain the importance of appropriate attire.

6. Develop a personal data sheet that could be used when applying for a job and formulate a set of questions which might be asked of an applicant during an interview.

Study Guide - Trade and Industrial Education (Textiles)
"Knitting"

1. Pg. 193, paragraph 1. The first sentence states the main idea. Rewrite this statement to make a question.

2. Pg. 193, section 2. Important terms for the lesson are defined here. Do not read further until you are sure of these words.

3. Pg. 194, section 3. From the information here, describe the basis of the knitted fabric.

4. Pg. 195, section 4. This section describes the types of weft knitting. List and define each type.

5. Pg. 197, section B. This section discusses tricot and raschel knitting. Do not read further until you are sure of these two points.

6. Skim the material to make sure you know the main points and reread any points that are unclear.

Study Guide - Prevocational Education
"The Electron"

1. Pg. 4, section 1. This section gives background material which is interesting but not essential for understanding the concepts. You may read this quickly or skip it entirely if you wish.

2. Pg. 4, column 2. From the information given, discuss the nature of matter.

3. Pg. 5, paragraph 4 discusses ionization. Do not read further until you understand this concept.

4. Pg. 5, column 2. After reading this section, list 4 conductors and 4 insulators.

Conductors	Insulators
a)	a)
b)	b)
c)	c)
d)	d)

5. Pg. 6, paragraph 4. After reading this paragraph, complete these statements.

   a) Like charges _____ each other.

   b) Unlike charges _____ each other.

Study Guide - Agriculture Education (Forestry)
"Reforestation Following Harvesting"

1. Define reforestation.

2. Name who is usually responsible for reforestation.

3. Define clearcutting.

4. Describe the process of selective cutting operations.

5. Explain why selective cutting is important and how it could affect the price per cord.

6. Discuss why public opinion should be carefully considered by the loggers and describe some things loggers can do to gain a more positive public image.

7. A landowner has had his/her forest completely cut over and has not reforested the land. There are no laws in that state requiring the owner to reforest the land. You are a logger who is concerned with ecology. Discuss the possible problems which could arise from un-reforested lands and explain what you could do to legally prevent these problems.

Study Guide - Trade and Industrial Education (Machine Shop)
"Taking Care of the Lathe"

1. What will happen to a lathe if it is not properly cleaned?

2. Why should compressed air not be used to clean a lathe?

3. What should be done to a lathe before mounting a chuck or face plate on the spindle nose?

4. Explain how the compound rest and tool assembly should be cleaned and describe what might happen if this is not done.

5. Explain why tools should be kept off the lathe bed and give some suggestions as to how tools might be organized to prevent this situation.

6. The headstock on the lathe which you are using is out of alignment. Explain how this could occur and discuss what should be done to correct it as well as what could have been done to prevent it.

Study Guide - Home Economics Education
"Plan First for Safety First in the Kitchen"

1. Pg. 348, paragraph 2. Tell where most accidents occur in the home and state 3 reasons for the accidents.
   a)
   b)
   c)

2. Pg. 348, paragraph 5. List 7 ways to prevent fires in the home.
   a)
   b)
   c)
   d)
   e)
   f)
   g)

3. Pg. 348, column 2. What should you do if you have a grease fire? Why should you never pour water on a grease fire?

4. Pg. 349, "To Prevent Burns." Read this section carefully and do not read further until you are sure of the information in this section.

5. Pg. 349, column 2. Why do you not apply oil or ointment to a burn?

6. Pg. 349. List the 7 ways to prevent cuts.
   a)
   b)
   c)
   d)
   e)
   f)
   g)

7. Pg. 350. Make sure you understand the treatment for bleeding and bruises before reading further.

8. Pg.350, column 2. Know all the precautions which should be taken to prevent electrical shock.

9. Pg. 350, column 2. Describe what lighting and cleaniness have to do with safety in the kitchen.

PART IV: APPENDICES

APPENDIX I: TEACHER RESOURCES

Appendix I-A

Guide For Introducing A Textbook

(Readence, J. E. **Content Area Reading: An Integrated Approach**, pp. 65-69)

It is unlikely that any content area text will be the most appropriate one for all students in a course. The wide range in students' prior knowledge and subject interests practically insures that your text will be frustrating for some students and too easy for others. Assuming that your particular content area text survives the evaluation checklist and your own informed observations, there is something you can do to help students perceive the text as a familiar learning aid rather than as a threatening obstacle. You can conduct a **text preview** to acquaint students with the text they will be using. This simple procedure should be introduced early in the term. It will go a long way toward making students feel they can use the text effectively. Undoubtedly, many of us have had the experience of "discovering" by sheer chance, often half-way through the term, that our text contained a glossary of difficult vocabulary. The text preview is designed to guide students to this and other text aids early in the term.

Conducting a Text Preview

The following activity should be conducted as a group task. The teacher reads each item on the text preview and indicates its location. This procedure can also be used to collect information for item 20 on the text evaluation checklist (student response). The following guide will help you conduct a text preview in your area.

Previewing Your Text

Name of subject _____

Title of textbook _____

_____

Author(s) _____

Author(s) qualifications (e.g., job experience, university degrees) _____

_____

Copyright date _____

Has the book been revised (brought up-to-date)? _____

_____

1. Preface, Forwords, and Introductions contain essentially the same information. These lead-in comments give the author(s) a chance to talk about why the book was written and how it is organized. Often, a suggestion about how to read the book is provided. Read the Preface (Foreword or Introduction). In the space below, use your own words to explain what the Preface told you about your text.

_____

_____

_____

_____

2. The Table of Contents provides an early "road map" of the whole text. It gives a good indication of the learning aids which are provided in the text. Answer the following questions in your own words by referring to the Table of Contents.

(1) Does the organization of topics in the book appear to be logical and easy to follow?

_____

_____

(2) How many total pages are there in your text?

_____

_____

(3) How complete do you think the treatment of the subject is in your book (i.e., very complete or only deals with a few aspects of the subject)?

_____

_____

(4) Using the Table of Contents, see if your text contains each of the following learning aids. Answer **yes** if you find it, **no** if you don't.

Glossary ___ Appendix ___ Bibliography ___ Index ___

3. The Glossary gives definitions of difficult technical terms used in the text. It is a valuable aid to understanding the vocabulary of a difficult subject. If your text has a Glossary, locate at least one difficult word supplied by your teacher and write the definition here.

_____

_____

_____

4. The Appendix provides additional information about a topic. An Appendix is located in the back of the book and contains information that supports and expands a chapter topic. If your text has an Appendix (or Appendices), write a list of some of the items you find there.

_____

_____

_____

_____

5. A Bibliography gives specific information about authors and books that were consulted during the writing of the text. Some of these books may be recommended as additional reading. The Bibliography is usually located at the end of the book (see the Table of Contents for its exact location), but it may follow each chapter. Locate the Bibliography in your text and write down three books you might want to read in addition to your text.

_____

_____

_____

_____

6. The Index provides the fastest means for locating topic information and names of people referred to in the text. Locate the Index in your book. Study the Index and list two or three kinds of information you see there.

_____

_____

_____

7. Many other textual aids, in addition to the Preface, Table of Contents, Glossary, Appendix, Bibliography, and Index are included in most texts. See if you can locate each of the following text aids (write **YES** if it's there; **NO** if it's not) and indicate in writing how each of these aids might help you understand the subject.

(1) Questions at the beginning of the chapters

_____

_____

(2) Objectives at the beginning of the chapters

_____

_____

(3) Pictures

_____

_____

(4) Illustrations or diagrams

_____

Activity

Directions

Using this text as an example, conduct a text preview. What did you find out that you were not aware of before?

Appendix I-B

What Vocabulary Should Be Taught?

(Butz, **VRP: Reading Power in the Content Areas-Training Manual**, p. 142)

How to select the important words that are worth the time necessary to teach can be a very big problem, particularly in some areas where new terms can number in the thousands.

When a choice has to be made regarding which terms should be taught:

1. Select words whose meanings must be understood if the selection is to be comprehended.

2. Select words that relate to key concepts.

3. Check the initial information (titles, graphs, summary, etc.) for terms which should be taught.

4. Select any term that you intend to include on any test.

5. Don't forget to teach terms which may cause difficulty due to multiple meanings.

6. Don't teach a term just because it is printed in italics in the text.

7. Don't teach terms that will be of little or no use once a student has passed the test.

Appendix I-C

Words with General and Technical Meanings

(Piercey, Reading Activities in Content Areas, pp. 240-245)

SUBJECT AREA

Automotive Mechanics

GRADE LEVEL

9-12

NAME OF ACTIVITY

Slippery Words

OBJECTIVE OF ACTIVITY

To help students recognize that some vocabulary words in automotive mechanics have more than one meaning and to encourage students to use context clues to get meaning.

STUDENT PREPARATION

None

TEACHER PREPARATION

Prepare the activity using the example or other sentences and vocabulary words. The activity requires ten yellow cards, each containing five incomplete sentences; fifty green cards, each containing a word with its definition and the number of points it is worth when correctly matched with a sentence.

PROCEDURE

Players can number from two to ten. Each player is given one yellow sentence card. In turn, he may draw five green cards. If he is able to match a word to the sentence in which it belongs, he receives the number of points noted n the green card. He may match as many of the five word cards as possible in turn. If he is unable to use any or all of the cards he has drawn, he must place the unused cards at the bottom of the pile face down. The turn passes to the next player. The winner has the highest number of points when all the green cards have been used.

Words for Green Cards (50 cards)

- barrel: the chamber of a pump in which the piston works (10 points)
- barrel: a wooden vessel with bulging sides and flat ends (5 points)
- battery: a combination of two or more galvanic cells electroncially connected to work together to produce electrical energy (10 points)
- battery: a large group or series of related things (a battery of questions) (5 points)
- bearing: the support and guide for a sliding shaft, pivot, or wheel (10 points)
- bearing: course, aid, direction (5 points)
- charged: supplied with a quantity of electricity, electrical energy (10 points)
- charged: accused formally (5 points)
- choke: a mechanism which, by blocking a passage, regulates the flow of gas and air (10 points)
- choke: to strangle, stifle, or suffocate; to suppress (5 points)
- clutch: a control, as a pedal, for operating the mechanism which engages or disengages a shaft with or from another shaft or rotating part (10 points)
- clutch: to grasp, seize, claw at, hold tightly (5 points)
- crank: type of arm or lever for imparting rotary motion to a rotating shaft, to rotate by means of a crank (10 points)
- crank: an ill-tempered, grouchy person (5 points)
- distributor: a device which directs electrical current to spark plugs (10 points)
- distributor: one who delivers to market in a particular area usually as a wholesaler (5 points)
- driver: a part transmitting force or motion (10 points)
- driver: a person who drives a vehicle (5 points)
- exhaust: the cylinder of an engine from which steam or gases escape; part of an engine through which the exhaust is ejected (10 points)
- exhaust: to draw out all that is essential in a subject or topic; to treat or study thoroughly (5 points)
- float: a device which regulates the level, supply, or outlet of liquid (10 points)
- float: a vehicle bearing a display in a parade or procession (5 points)
- governor: an attachment to a machine for automatic control of speed (10 points)
- governor: the chief executive or head of a political unit (as a state) (5 points)
- hood: the movable cover used to protect the engine (10 points)
- hood: hoodlum, burglar, gangster (5 points)
- housing: a fully enclosed case and support for a mechanism (10 points)
- housing: shelter, lodging, or dwelling (5 points)

- jack: a mechanical device, one used to raise a heavy body a short distance (10 points)
- jack: a playing card bearing the figure of a man (5 points)
- pilot: a guide for centering or positioning to adjacent parts (10 points)
- pilot: a person qualified to operate an airplane, balloon, or other aircraft (5 points)
- rim: the outer circle of a wheel attached to the hub by spokes; a circular strip of metal forming the connection between an auto wheel and tire (10 points)
- rim: the outer edge, border, margin, or brink of a curved area (5 points)
- seal: to bring (a plug, jack or socket) into locked or fully aligned position; a closing or fastening that tightly secures parts (10 points)
- seal: a decorative stamp, especially as given to contributors to a charity (5 points)
- seat: a base on which an engine or motor valve rests (10 points)
- seat: something designed to support a person in a sitting position, as a chair or bench (5 points)
- shell: a metal, pressure-resistant outer casing (10 points)
- shell: an attitude or manner of reserve that usually conceals one's emotions, thoughts (5 points)
- shield: a covering usually of metal, placed around electrical devices or circuits (10 points)
- shield: to protect someone or something with or as with a shield (5 points)
- shift: to change gears from one ratio or arrangement to another, a gearshift (10 points)
- shift: a person's scheduled period of work (5 points)
- terminals: mechanical devices by means of which an electric connection to an apparatus is established (10 points)
- terminals: ends of a carrier line (as a railroad, truck, bus) with handling and storage facilities and stations (5 points)
- throttle: a lever, pedal, handle for controlling the flow of fluid to control the speed of an engine (10 points)
- throttle: to choke or to strangle (5 points)
- tire: a ring or band of rubber, either solid or hollow and inflated, placed over the rim of a wheel to provide traction, resistance to wear (10 points)
- tire: to weary, to reduce in strength (5 points)

Sentences for Yellow Cards (10 cards)

1. The _____ granted a pardon to the prisoner.
2. The spark plugs were not receiving the electrical current from the _____.
3. He pushed the _____in order to control the speed of the engine.
4. Many cars have an automatic_____ for controlling the flow of gas.
5. The empty _____ was used by the movers for packing dishes.

1. Jerome, after shoveling snow for an hour, was beginning to _____.
2. To remove the valve _____ insert, use the proper puller nut and valve seat puller.
3. Insert the _____ into the valve guide, then drive the insert into place.
4. He put up his arm as a _____ against the blows of the attacker.
5. The _____ of the car was not cited at the scene of the accident.

1. A gangster is sometimes known as a _____ .
2. A pedal is a control used to operate a _____.
3. The investigator fired a _____ of questions at the suspect.
4. A Christmas _____ was placed on the envelope.
5. He placed the _____ under the car in order to raise it into the air.

1. Harold lived within his own _____ to conceal his emotions.
2. When checking _____ level, be sure it is parallel to the body mounting surface.
3. He preferred to work at night _____ so that he could go to school during the day.
4. The _____ holds the tire in place.
5. The battery _____ were corroded.

1. The group was unable to find its _____ in the vast wilderness.
2. It was necessary for him to _____ the old model car in order to start it.
3. The driver was _____ with criminal negligence.
4. An excessive amount of gases was being ejected from the _____.
5. When disassembling a windup starter, do not attempt to remove the starter spring from its _____.

1. Before repairing the _____ on your engine, check the top speed with a tachometer.
2. Jack served as wholesale _____ for the XYZ Candy Company.
3. The assailant _____ the victim after robbing him.
4. Mary _____ back her tears and tried to smile.
5. The mechanic replaced the _____ of the pump.

1. Before setting out on his trip, he purchased four new _____ for his car.
2. He sat nervously on the edge of the _____ .
3. The _____ brought the plane in for a safe landing.
4. He replaced the metal _____, or covering, surrounding the electrical circuit.
5. Drive the valve insert into place with the _____.

1. The mechanic lifted the _____ of the car so that he could check the battery.
2. The woman saw the burglar _____ his throat as she fired the shot.

3. The electrical connections of the cells in the _____ were corroded.
4. The problem seems to be a leak in the transmission _____ .
5. In his hand he held the _____ of spades.

1. In disassembling the starter motor, remove the motor support cover from the motor _____ .
2. The homecoming queen rode atop a flower bedecked _____ .
3. One must _____ gears in order to move the car into reverse.
4. From the _____ of the canyon one views a glorious sight.
5. The railroad _____ were teeming with holiday travelers.

1. To check the ball _____, rotate the part slowly by hand; replace if roughness is noted.
2. Miss Jones, the history teacher, was known as an old _____ .
3. When he was unable to start his car, the mechanic _____ the battery.
4. It requires a great deal of talking to _____ this subject.
5. In most urban areas, low cost _____ is being provided.

Appendix I-D

Key Word Glossaries

(Butz, **VRP: Reading Power in Content Areas-Training Manual**, pp. 143-144)

Students can benefit greatly from having access to a listing of the key words necessary to the content area. In an effort to assist adopting districts,the Vocational Reading Power Project has developed Key Word Glossaries for the following areas:

1. Advertising
2. Appliance Repair
3. Architectural Drafting
4. Auto Body Repair
5. Auto Mechanics
6. Building Trades
7. Building Services
8. Child Care
9. Clothing Services
10. Commercial Art
11. Cosmetology
12. Data Processing
13. Dental Office Assisting
14. Diesel Power
15. Advanced Display
16. Distribution Education
17. Engineering Drafting
18. Retail Floral Sales
19. Fluid Power
20. Food Services
21. Greenhouse/Landscaping
22. Heating, Air Conditioning
23. Industrial Electricity
24. Industrial Electronics
25. Nurses Aide Orderly
26. Marine & Small Engines
27. Medical Office Assisting
28. Modern Printing Processes
29. Radio-T.V. Repair
30. Refrigeration
31. T.O.P.S. (Total Service Procedure Systems)
32. Welding
33. Machine Shop

The glossaries make the teaching of technical and content specific vocabulary practical for the instructor and effective for the students because of the way in which they have been developed. Each page of a glossary has been divided into six separate entries. There is one key word for every entry. All the words have been divided into syllables to help the student pronounce them. Under the word are two definitions for that word. The "A" definition is more difficult and more specific. The "B" definition is easier and more general. During a learning activity, students are to use both definitions to help them comprehend. On the back of each card, space has been provided for the student to write the definition of the word as he/she understands it. To help make their meaning clearer, all key words have been put into sentences.

The following page contains a sample of the Key Word Glossary entries.

EMPLOYER
em ploy er

A. One who employs especially for wages.

B. The person who hires for pay.

Ms. Brown is Jill's employer.

ENTERPRISE
en ter prise

A. The venture or project being undertaken in business.

B. A store where goods and services may be bought.

The carry-out pizza enterprise is doing a profitable business.

ENTREPRENEURS
en tre pre neurs

A. Those engaged in the enterprise as owners or managers.

B. The people who invest or work in business.

Do you know any entrepreneurs?

EXCLUSIVE
ex clu sive

A. Not admitting of something else, incompatible.

B. Private.

This is an exclusive club for men.

FAD
fad

A. When a style catches the fancy of a sizeable group of people, has a brief popularity, and dies out quickly.

B Something new; everyone buys it, then no one buys it.

"Hot pants" can be called a fad.

FASHION
fash ion

A. Any style, in merchandise, art, or activity that is generally accepted or practiced by a sizeable group of people.

B. Newest style.

The paper shows the latest fashions from Paris.

Appendix I-E

Suggested Uses for Key Word Glossaries

(Butz, VRP: Reading Power in the Content Areas-Training Manual, p. 146)

By using the VRP Project's Key Word Glossaries or the glossary which you develop, you can teach the highly specialized vocabulary of your content area. Below are some suggested methods and learning activities.

Initial Vocabulary Awareness	The glossary can be used to identify and pre-teach selected key words in an occupational area.
Reinforcement	The glossary can be used to reinforce or augment a topic or concept that is currently being taught.
Two Definitions: General and Technical or Content Specific	During a learning activity, have students use both glossary definitions to help them understand the meaning of the word.
Ongoing Topical Card Box	Card boxes can be developed and organized in topics, concepts, or units of instruction. New vocabulary words can be added as the students or instructor identifies additional content words while working through the course content.
Referencing	The glossary pages can be placed on rings, or in a note book, to provide reference material by topic or concept.
Language Master	The glossary entries can be placed on Language Master cards. (These are cards which have four-track audio tape on the back.) The Language Master unit will allow for programmed instruction and will allow students to hear, see, and say the words.

Labeling	The glossary entries can be laminated and placed on machinery or equipment to identify and label the object. This allows for paired association, seeing the written symbol in association with the concrete object.
Review	The glossary can be used as a review for any given topic by having the students write their own understanding of the words.

Appendix I-F

Abbreviations

The Recipe

(Sasse, **Discovering Food Student Guide**, p. 21)

ACTIVITY 2

The items in the right-hand column are abbreviations for the measuring terms found in the left-hand column. Place the letter of the abbreviation in the blank to the left of the correct term.

Measuring Terms		Abbreviations	
_____	1. Celsius	A.	doz.
_____	2. centi	B.	hr.
_____	3. cup	C.	k
_____	4. dozen	D.	m
_____	5. gram	E.	pd.
_____	6. hour	F.	lb.
_____	7. joule	G.	C
_____	8. kilo	H.	L
_____	9. liter	I.	oz.
_____	10. meter	J.	g
_____	11. milli	K.	j
_____	12. minute	L.	min.
_____	13. ounce	M.	t.
_____	14. pint	N.	qt.
_____	15. pound	O.	c
_____	16. quart	P.	pt.
_____	17. tablespoon	Q.	C.
_____	18. teaspoon	R.	T.

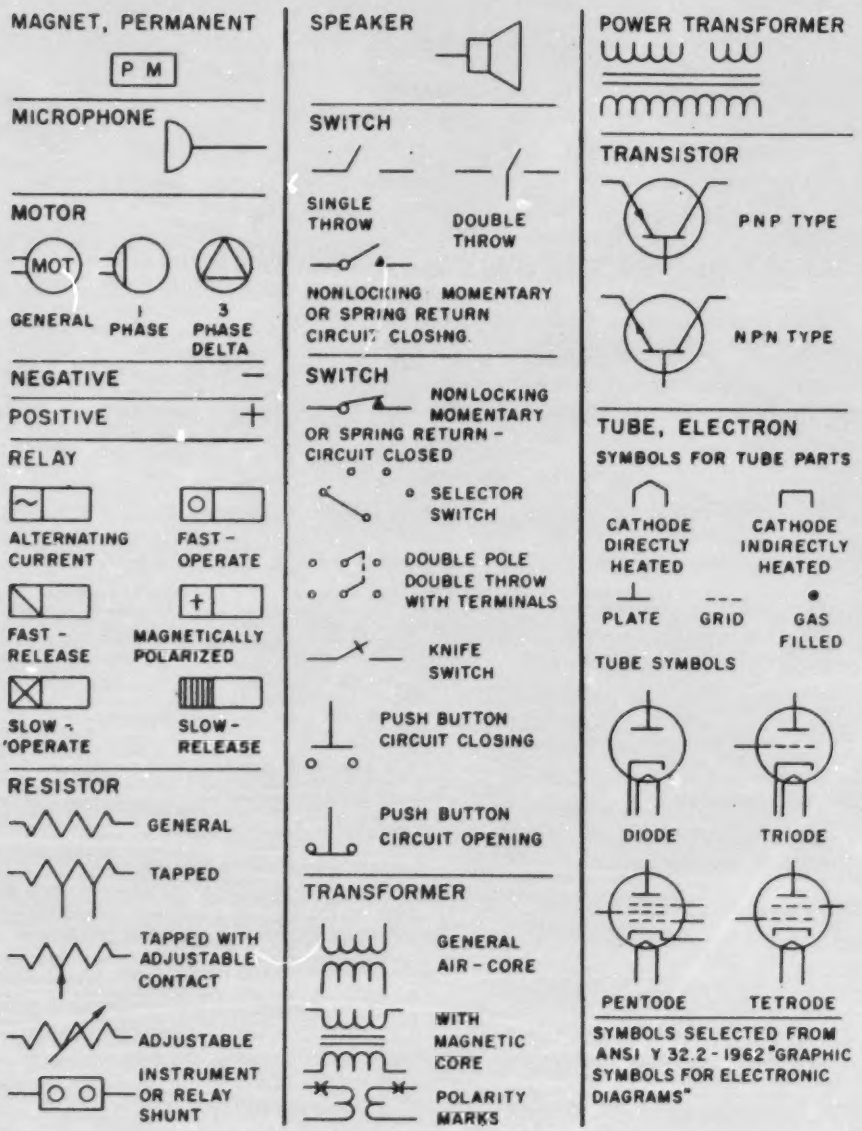
Common Acronyms

AWOL	CORE
SNAFU	SCUBA
LASER	CARE
NOW	WACS

Appendix I-G

Reading Symbols

(Spence, **Basic Industrial Drafting**, p. 167)



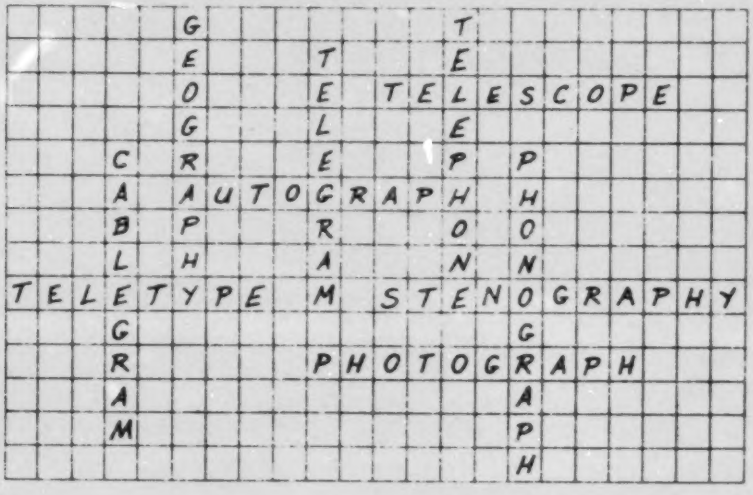
16-1B. *Electrical and electronic symbols.*

Appendix I-H

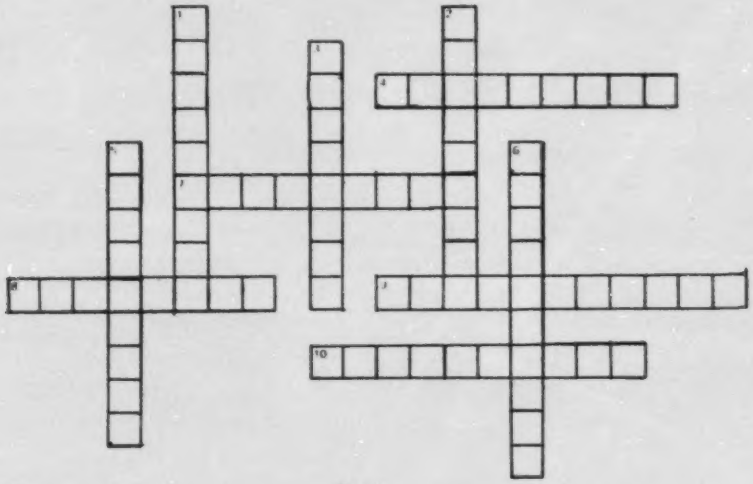
Directions For Constructing Crossword Puzzles

(Burmeister, Reading Strategies for Middle and Secondary School Teachers, pp. 120-121)

Use crossword puzzles. They're easy to make. Keep a supply of graph paper and use only infrequent crossovers. For example, if you wish to use the words telegram, telephone, teletype, telescope, phonograph, stenography, photograph, geography, cablegram, autograph, fill them in on your graph paper, thus:



Next, clip this sheet over a ditto stencil and use a ruler to draw in the needed boxes. Take off the graph paper and number the boxes. Write the key on the bottom of the page, thus:



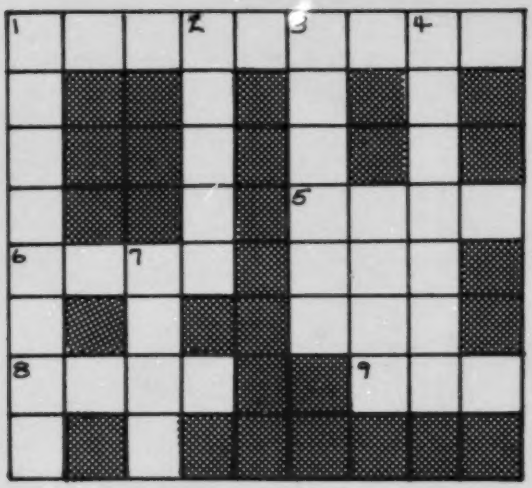
Across
4. instrument for "[illegible] from far"
7. the writing of one's own name
8. typing from far
9. writing in shorthand
10. picture writing, "light writing"

Down
1. "earth writing," study or writing about the earth
2. "sound from far"
3. "writing from far"
5. message sent through an underwater tube
6. "sound writing"

Appendix I-I

Crossword Puzzle

(Butz, VRP: Reading Power in Content Areas-Training Manual, p. 171)



ACROSS

1. The internal resistance of a substance to being fluid.
5. A design of brake commonly used on front wheels.
6. What fuel is stored in.
8. Power of high beam distance headlights is magnified by this.
9. The number of batteries necessary to start a car.

DOWN

1. A highly combustible fuel is referred to as _____.
2. The shaft which when turned moves the pistons up and down.
3. The residual deposit in settled oil that is well used.
4. A bar used in cars to minimize twisting in cornering.
7. The number of glowplugs necessary in a gasoline engine.

ANSWERS

ACROSS		DOWN	
1.	Viscosity	1.	Volatile
5.	Disc	2.	Crank
6.	Tank	3.	Sludge
8.	Lens	4.	Torsion
9.	One	7.	None

Appendix I-J

FIRST HUNDRED WORDS AMERICAN HERITAGE WORD FREQUENCY LIST *

1. the	21. be	41. which	61. into	81. made
2. of	22. this	42. their	62. has	82. over
3. and	23. from	43. said	63. more	83. did
4. a	24. I	44. if	64. her	84. down
5. to	25. have	45. do	65. two	85. only
6. in	26. or	46. will	66. like	86. way
7. is	27. by	47. each	67. him	87. find
8. you	28. one	48. about	68. see	88. use
9. that	29. had	49. how	69. time	89. may
10. it	30. not	50. up	70. could	90. water
11. he	31. but	51. out	71. no	91. long
12. for	32. what	52. them	72. make	92. little
13. was	33. all	53. then	73. than	93. very
14. on	34. were	54. she	74. first	94. after
15. are	35. when	55. many	75. been	95. words
16. as	36. we	56. some	76. its	96. called
17. with	37. there	57. so	77. who	97. just
18. his	38. can	58. these	78. now	98. where
19. they	39. an	59. would	79. people	99. most
20. at	40. your	60. other	80. my	100. know

ALPHABETICAL LIST OF FIRST HUNDRED

a	but	for	in	make	only	than	to	which
about	by	from	into	many	or	that	two	will
after	called	had	is	may	one	the	was	with
all	can	had	it	most	out	their	water	words
an	could	have	its	my	over	them	way	would
and	did	he	just	no	people	then	we	up
are	do	him	know	not	said	these	were	use
as	down	his	like	now	see	there	what	very
at	each	how	little	of	she	they	when	you
be	find	I	long	on	so	this	where	your
been	first	if	made	one	some	time	who	

*John B. Carroll, P. Davies, and B. Richman, **American Heritage Word Frequency Book** (Boston: Houghton, Mifflin, 1971). The list is based on words encountered by pupils in grades 3-9. The first ten words make up approximately one-fourth of all the running words the pupil encounters; the first hundred make up approximately one-half the running words he meets.

SECOND HUNDRED WORDS AMERICAN HERITAGE WORD FREQUENCY LIST

1. get	21. also	41. help	61. should	81. sound
2. through	22. around	42. put	62. Mr.	82. below
3. back	23. another	43. years	63. home	83. saw
4. much	24. came	44. different	64. big	84. something
5. before	25. come	45. away	65. give	85. thought
6. go	26. work	46. again	66. air	86. both
7. good	27. three	47. off	67. line	87. few
8. new	28. word	48. went	68. set	88. those
9. write	29. must	49. old	69. own	89. always
10. our	30. because	50. number	70. under	90. looked
11. used	31. does	51. great	71. read	91. show
12. me	32. part	52. tell	72. last	92. large
13. man	33. even	53. men	73. never	93. often
14. too	34. place	54. say	74. us	94. together
15. any	35. well	55. small	75. left	95. asked
16. day	36. such	56. every	76. end	96. house
17. same	37. here	57. found	77. along	97. don't
18. right	38. take	58. still	78. while	98. world
19. look	39. why	59. between	79. might	99. going
20. think	40. things	60. name	80. next	100. want

ALPHABETICAL LIST OF SECOND HUNDRED

again	because	don't	great	man	old	set	through	well
also	before	end	help	me	our	should	things	why
along	below	even	here	men	own	show	think	went
always	between	few	home	might	part	something	thought	while
air	big	every	house	Mr.	place	still	together	word
another	both	found	large	much	put	those	three	work
any	came	get	last	must	read	small	too	world
around	come	give	left	name	right	sound	under	write
asked	day	go	live	never	same	such	us	years
away	different	going	look	off	saw	take	used	
back	does	good	looked	often	say	tell	want	

THIRD HUNDRED WORDS AMERICAN HERITAGE WORD FREQUENCY LIST

1. school
2. important
3. until
4. 1
5. form
6. food
7. keep
8. children
9. feet
10. land
11. slide
12. without
13. boy
14. once
15. animals
16. life
17. enough
18. took
19. sometimes
20. four
21. head
22. above
23. kind
24. began
25. almost
26. live
27. page
28. got
29. earth
30. need
31. far
32. hand
33. high
34. year
35. mother
36. light
37. parts
38. country
39. father
40. let
41. night
42. following
43. 2
44. picture
45. being
46. study
47. second
48. eyes
49. soon
50. times
51. story
52. boys
53. since
54. white
55. days
56. ever
57. paper
58. hard
59. near
60. sentence
61. better
62. best
63. across
64. during
65. today
66. others
67. however
68. sure
69. means
70. knew
71. it's
72. try
73. told
74. young
75. miles
76. sun
77. ways
78. thing
79. whole
80. hear
81. example
82. heard
83. several
84. change
85. answer
86. room
87. sea
88. against
89. top
90. turned
91. 3
92. learn
93. point
94. city
95. play
96. toward
97. five
98. using
99. himself
100. usually

ALPHABETICAL LIST OF THIRD HUNDRED

above
across
against
almost
animals
answer
began
being
best
better
boy
boys
change
children
city
country
days
during
earth
enough
ever
example
eyes
far
father
feet
five
following
form
food
four
got
hand
hard
head
hear
heard
high
himself
however
I
important
it's
keep
kind
knew
land
learn
let
life
light
live
means
miles
near
need
night
once
others
page
parts
paper
picture
play
point
room
school
sea
second
sentence
several
life
since
sometimes
soon
story
study
sun
sure
3
thing
times
took
toward
try
today
told
top
top
turned
2
until
using
usually
ways
white
whole
without
year
young

FOURTH HUNDRED WORDS AMERICAN HERITAGE WORD FREQUENCY LIST

1. money	21. half	41. really	61. though	81. letter
2. seen	22. sentences	42. table	62. started	82. among
3. didn't	23. red	43. remember	63. idea	83. 4
4. car	24. fish	44. tree	64. call	84. A
5. morning	25. plants	45. 000	65. lived	85. letters
6. given	26. living	46. course	66. makes	86. comes
7. trees	27. wanted	47. front	67. became	87. able
8. I'm	28. black	48. known	68. looking	88. dog
9. body	29. eat	49. American	69. add	89. shown
10. upon	30. short	50. space	70. become	90. mean
11. family	31. United Stated	51. inside	71. grow	91. English
12. later	32. run	52. ago	72. draw	92. rest
13. turn	33. kinds	53. making	73. yet	93. perhaps
14. move	34. book	54. Mrs.	74. hands	94. certain
15. face	35. gave	55. early	75. less	95. six
16. door	36. order	56. I'll	76. John	96. feel
17. cut	37. open	57. learned	77. wind	97. fire
18. done	38. ground	58. brought	78. places	98. ready
19. group	39. lines	59. close	79. behind	99. green
20. true	40. cold	60. nothing	80. cannot	100. yes

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ALPHABETICAL LIST OF FOURTH HUNDRED

A	call	done	fish	I'll	lines	000	perhaps	trees
able	cannot	door	front	I'm	lived	open	seen	true
ago	car	draw	gave	inside	living	order	sentences	turn
American	certain	early	given	John	makes	places	short	United States
among	close	eat	green	kinds	making	plants	shown	upon
become	cold	English	ground	known	mean	ready	six	wanted
behind	comes	face	group	later	money	really	space	wind
black	course	family	grow	learned	morning	red	started	yet
body	cut	feel	half	less	move	remember	table	yes
book	didn't	fire	hands	letter	Mrs.	rest	though	
brought	dog	fish	idea	letters	nothing	run	tree	

FIFTH HUNDRED WORDS AMERICAN HERITAGE WORD FREQUENCY LIST

1. built
2. special
3. ran
4. full
5. town
6. complete
7. oh
8. person
9. hot
10. anything
11. hold
12. state
13. list
14. stood
15. hundred
16. shows
17. ten
18. fast
19. seemed
20. felt
21. kept
22. America
23. notice
24. can't
25. strong
26. voice
27. probably
28. needed
29. birds
30. area
31. horse
32. Indians
33. sounds
34. matter
35. stand
36. box
37. start
38. that's
39. class
40. piece
41. slowly
42. surface
43. river
44. numbers
45. common
46. stop
47. am
48. talk
49. quickly
50. whether
51. fine
52. 5
53. round
54. dark
55. girls
56. past
57. ball
58. girl
59. tried
60. road
61. questions
62. blue
63. meaning
64. coming
65. instead
66. either
67. held
68. friends
69. already
70. warm
71. taken
72. gone
73. finally
74. summer
75. understand
76. moon
77. animal
78. mind
79. outside
80. power
81. says
82. problem
83. longer
84. winter
85. Indian
86. deep
87. mountains
88. heavy
89. carefully
90. follow
91. beautiful
92. beginning
93. moved
94. everyone
95. leave
96. everything
97. game
98. system
99. bring
100. watch

ALPHABETICAL LIST OF FIFTH HUNDRED

aready
am
America
animal
anything
area
ball
beautiful
beginning
birds
blue
box
bring
built
can't
carefully
class
coming
common
complete
dark
deep
either
everyone
everyting
fast
felt
finally
fine
5
follow
friends
full
game
girl
girls
gone
heavy
held
hold
horse
hot
hundred
Indian
Indians
instead
kept
leave
list
longer
matter
meaning
mind
moon
mountains
move
needed
notice
numbers
oh
outside
past
person
piece
power
probably
problem
questions
quickly
ran
river
road
round
says
seemed
shows
slowly
sounds
stand
special
start
state
strong
stood
stop
summer
surface
system
taken
talk
ten
that's
town
tried
understand
voice
warm
watch
whether
winter

Appendix I-K

Constructing Sight Word Exercise for Content Lessons

(Herber, **Teaching Reading in Content Fields**, pp. 159-160)

Select technical vocabulary for a unit of study.

Plan a set of about 25 items arranged like the samples below.
If the unit does not have twenty-five technical terms, repeat some of them.

With some samples the direction will be "Underline the word in each row which is just like the first word of the row." For others the direction is "In each row underline the two words that are exactly alike." For others "Underline the item in each row that goes with the first word of the row."

The direction used and the degree of similarity among the choices can control the difficulty of the exercise.

Make provision for timing the exercises. Prepare progress charts for pupils.

Use of this type exercise twice for each unit should be enough. Pupils should check their own papers or each other's work.

Samples

1.	multiple	multiply	multitude	multiple	multiped
2.	complementary	complimentary	complication	complementing	complementary
	.....				
25.	intersecting	intersecting	interesting	intervening	interacting

---

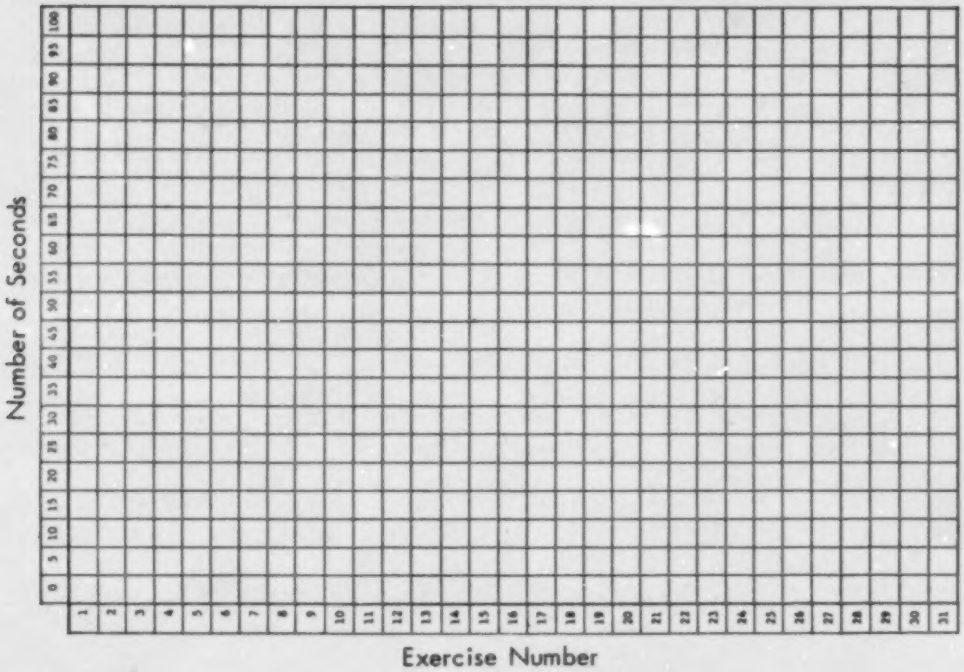
1.	orbit	nadir	splashdown	recovery	orbit
2.	zenith	crater	lift-off	zenith	module
	.....				
25.	retrorocket	LEM	heat-shield	retrorocket	lunar

1.	torn	term	turh	tarn	term
2.	fractious	facetious	fictitious	felicitous	facetious
	.....				
25.	malicious	malfeasance	malediction	mallifluous	malfeasance

---

1.	IRON	Fe	FE	fe	Fe	Fl
2.	HYDROGEN	H	He	h	Hf	H
	.....					
25.	SULFATE	SO_4	S_4O	SO_4	SO^4	SO_4

PROGRESS CHART*



*Place accuracy scores in appropriate boxes

% Accuracy = $\frac{\text{number right}}{\text{number of items}}$

Appendix I-L

Sight Words From Home Economics Word Search

(Sasse, Discovering Food Student Guide, 1978)

SALADS

The following words about salads are hidden in the puzzle below. Words are listed horizontally, vertically, or diagonally in either direction. Circle the words as you find them in the puzzle.

Accompaniment	Cooked dressing	Gelatin	Nutritious
Appetizer	Dessert	Greens	Protein
Base	Endive	Iceberg	Romaine
Bibb	Escarole	Leaf	Salad
Body	French	Main dish	Spinach
Chilled	Fruit	Mayonnaise	Vegetable

I	C	O	O	K	E	D	D	R	E	S	S	I	N	G
C	H	I	L	E	N	I	A	M	O	R	R	O	I	E
E	I	C	B	B	I	B	L	E	A	N	D	C	E	L
S	L	I	N	I	B	I	A	E	L	F	E	M	T	A
U	L	G	R	E	E	N	S	B	A	B	S	A	O	T
O	E	S	C	A	R	O	L	E	E	F	S	Y	R	I
I	D	N	I	U	R	F	R	R	R	O	E	O	P	N
T	B	O	D	Y	E	R	G	U	N	T	R	N	I	M
I	A	A	P	P	E	T	I	Z	E	R	T	N	O	A
R	S	V	E	G	E	T	A	B	L	E	L	A	S	Y
T	E	N	D	I	V	E	M	A	I	N	D	I	S	H
U	T	I	P	P	A	H	C	A	N	I	P	S	O	N
N	O	A	C	C	O	M	P	A	N	I	M	E	N	T

Appendix I-M

Sight Words from Home Economics Scrambled Words

(Grubb, **Games for Learning**, 1978)

Scrambled Words: Unscramble the words below to find the real words. The list of words at the bottom of the page will help you. Check them off as you go. Write each correct word in the space near the scrambled word.

Laundry words

lecabh _____

eshawr _____

poas _____

rerdy _____

lctoehs _____

terdetneg _____

brfaic _____

tensofer _____

nips _____

clyec _____

seinr _____

aold _____

load	bleach	soap
spin	fabric	softener
detergent	washer	clothes
cycle	rinse	dryer

Appendix I-N

Context For Word Identification

(Piercey, Reading Activities in Content Areas, pp. 67-69)

SUBJECT AREA

Shorthand

GRADE LEVEL

11 - 12

NAME OF ACTIVITY

Shorthand Cross-Clue Puzzle

OBJECTIVE OF ACTIVITY

To facilitate learning shorthand symbols through context clues.

STUDENT PREPARATION

None

TEACHER PREPARATION

Compose several paragraphs to use as the base for the cross-clue puzzle (see example)* or copy a passage from a shorthand text. Make sure that the passages contain context clues, so students can get a hint from the words surrounding the blank. For beginners, the passage should be a composite of words and symbols, as in the example shown. (As shorthand students become more proficient, write the entire passage in symbol form.) Prepare the puzzle form and the key.

PROCEDURE

The teacher may want the whole class to work on the puzzle or may assign the puzzle to those students who could profit from having an alternate route for practice. Students can check their accuracy with the key.

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Notice to Employees

With the enclosed (9D) ___ the company sends you (21A) ___ very best wishes for a happy holiday (5D) ___.

In (6A) ___ to sending our greetings, we would (19D) ___ to share with you (4A) ___ plans for the (18D) ___ year. Curtailment of (11D) ___ in the (16A) ___ quarter (1D) ___ upon us a curtailment of expenses. All employees are asked (8D) ___ save (7D) ___ ordinary expenses "at work" as you (3D) ___ "at (12A) ___" (20A) ___ lights, (17D) ___, air conditioning. While paid holidays will remain the same in (22A) ___ new year, the following will be shelved until (15D) ___ returns to normal: one coffee (15A) ___ per day, summer (2D) ___. Christmas (2A) ___, and unfortunately, the Christmas (10A) ___. Despite the curtailments, let's try to (13D) ___ next year a (14D) ___ New Year.

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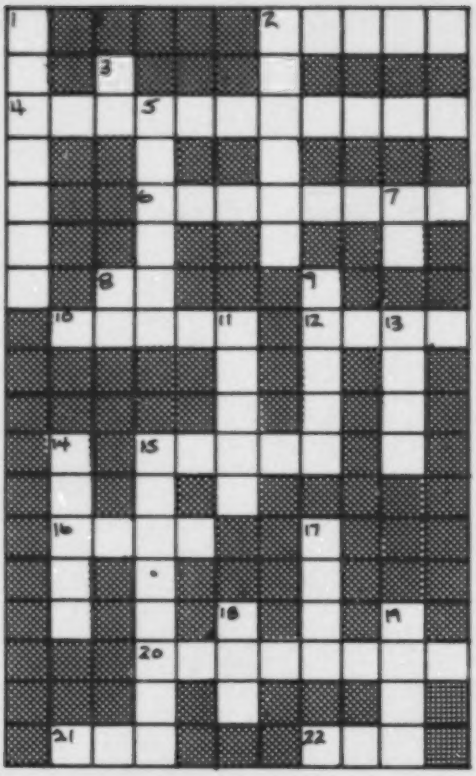
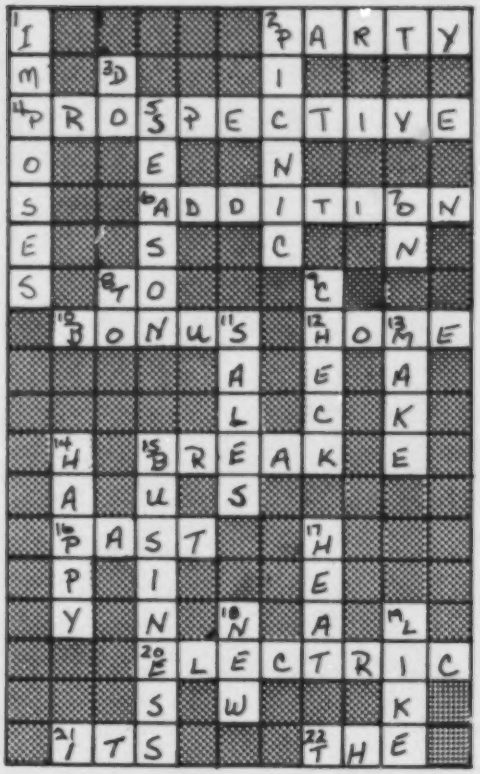
Shorthand
Cross-Clue Puzzle



Shorthand
Cross-Clue Puzzle Key



Appendix I-O

Basic Phonics Information

THE SHORT VOWEL SOUNDS ARE:

ă as in at

ĕ as in egg

ĭ as in it

ŏ as in ox

ŭ as in us

THE LONG VOWEL SOUNDS ARE:

ā as in ate

ē as in eat

ī as in ice

ō as in hope

ū as in use

SILENT CONSONANTS:

Gh is silent in many words--tonight, fight

W is often silent before r--write, wring

K is usually silent before n at the beginning of a word--knot, knew, knit

H is silent following g at the beginning of a word--ghost

double consonants--only one is sounded--common, funny

EXPLANATIONS:

CONSONANT BLENDS--two or more consonants working together so that each sound is heard in the blend
st<u>o</u>ve, sa<u>n</u>d, ba<u>n</u>k

CONSONANT DIGRAPH--two consonants making a new single sound
si<u>ng</u>, <u>th</u>at, <u>ch</u>uck
Regular consonant digraphs represent a sound neither letter represented alone - si<u>ng</u>, <u>th</u>at; other consonant digraphs make one sound - pa<u>ck</u>.

DIPHTHONGS--two vowel sounds blended so closely together that a compound sound is formed--b<u>oy</u>, o<u>il</u>

VOWEL DIGRAPH--two vowels together making a single sound
<u>au</u>to, b<u>oo</u>k, b<u>oa</u>t

VOWELS with r--the r changes the sound of the vowel before it---car, bird, orange

SCHWA--unstressed or unaccented vowel sound. The sound is like a very short "uh," ə .

PREFIX--meaningful unit at the beginning of a word--mis, sub.

SUFFIX--meaningful unit at the end of a word that changes the function of the word--less, ish, y

INFLECTIONAL ENDINGS--s, es, 's, ed, ing, er, est--plurals, possession, comparison, verb forms

PHONICS GENERALIZATIONS:

1. When short words end in a consonant followed by e, the e is usually silent and the preceding vowel is long.

   like, cute, stone, skate

2. When certain vowel digraphs representing a single sound come together in a word or syllable, the first vowel is usually long and the second is silent.

   boat, drain, blow

3. The sound of a single vowel letter in a word or syllable if it comes at the end of the word or syllable, usually is long.

   cry, ago, he

4. The sound of a single vowel letter in a word or syllable ending in a consonant is usually short.

   cat, ask, cup

5. When c precedes e, i, or y, the sound of c is soft (as s); when c precedes a, o, or us, the sound of c is usually hard (as K).

   city, cottage, cent, call

6. When g precedes e, i, or y, the sound of g is soft (as j); when g precedes a, o, or u, the sound of g is hard (as g).

   gem, gang, gypsy, going

SYLLABICATION GENERALIZATIONS:

1. Prefixes and suffixes usually form separate syllables--
   re act, in vent, peace ful, work er

2. Divide between two consonants surrounded by two sounded vowels--ladder, signal, picnic

3. Divide in front of a single consonant surrounded by two vowels--potato, table, picnic

4. If a word ends in le preceded by a consonant, that consonant goes with the le to make the final syllable--bun dle bu gle

5. Blends usually stay together--sur prise hun dred

6. Do not divide ck at the end of syllables with one short vowel--pack age, jack et

7. The - ed is usually a separate syllable when added to a word that ends in t or d--sound ed

NOTE: THE NUMBER OF VOWEL SOUNDS THAT ARE HEARD IN A WORD TELLS HOW MANY SYLLABLES THE WORD CONTAINS--RECEIVE, RAIN

ACCENT

Words have a primary accent and one or more secondary accents. A visual clue to vowel sounds usually applies only to the primary accented syllables--apple, alone.

1. Words of two or three syllables are usually accented on the first syllable--in sù late, sul fur

2. In compound words the primary accent is on or within the first word.

3. A word's context often determines accent--récord record' contests contests'

4. In multisyllable words of three or more syllables the first or second syllable is usually accented.

5. When the last syllable of a word ends in le, the syllable is usually unaccented; tum ble, ma ple

6. When one or more pretix(es) or suffix(es) is added to a root word, the accent if usually on the root word.

SOURCES

Hafner, **Improving Reading in Secondary Schools**, pp. 87-93.

Raetsch, Frederick C. Classroom material presented in January, 1974, incorporating material from William S. Gray: Clemson University.

Shepherd, **Comprehensive High School Reading Methods**, pp. 51-70.

Compiled by Susan O'Neal

Appendix I-P

Signals for Thought Patterns

(Shepherd, **Comprehensive High School Reading Methods**, pp. 88-89)

Students should note structure words (also called signal words, clue words, connectives, or empty words) in the material to discover how the author thinks, the direction of his thought, as well as the interrelationships and the degree of importance he wishes to give to ideas. Commonly used structure words are listed below.

I. Structure words indicating additional ideas

A. Words pointing to coordinate ideas, adding to the total thought and signalling similarity of ideas:

AND	FURTHEREMORE	BESIDES	LIKEWISE
ALSO	PLUS	TOO	SIMILARLY
ANOTHER	OTHERWISE	AFTER THAT	AGAIN
IN ADDITION	MOREOVER	AS WELL AS	SINCE
SINCE THEN	NOT ONLY BUT ALSO		

B. Words pointing to final or concluding ideas:

CONSEQUENTLY	IN CONCLUSION	THEN
THUS	IN SUMMATION	TO SUM UP
HENCE	AT LAST	IN BRIEF
THEREFORE	FINALLY	IN THE END
AS A RESULT	IN RETROSPECT	ACCORDINGLY

II. Structure words indicating a change in ideas by reversing, qualifying, or modifying ideas already presented:

IN CONTRAST	ON THE OTHER HAND	FOR ALL THAT
TO THE CONTRARY	BUT	NEVERTHELESS
OPPOSED TO	IN SPITE OF	YET
CONVERSELY	ALTHOUGH	STILL
HOWEVER	EITHER-OR	EVEN IF
EVEN THOUGH		

III. Structure words indicating concrete application of a thought:

BECAUSE	SPECIFICALLY	PROVIDED
FOR EXAMPLE	FOR INSTANCE	LIKE, AS

IV. Structure words pointing to relationships among and between ideas:

A. Time relationships

IN THE FIRST PLACE	LAST	PREVIOUSLY
AT THE SAME TIME	NOW	HEREAFTER
THEREAFTER	LATER	AT LAST
IN RETROSPECT	AFTER	AT LENGTH
MEANWHILE	BEFORE	FOLLOWING
FINALLY	IMMEDIATELY	

B. Space relationships

HERE	CLOSE	BY	FURTHER ON	TO THE EAST
THERE	FAR	AWAY	ABOVE	WESTWARD
YONDER	NEAR	UNDER	ACROSS	BENEATH
EVERYWHERE				

C. Related in degree

MANY	LITTLE	SOME	BEST	FEWER	GREATER
MORE	LESS	ALL	WORST	FEWEST	GREATEST
MOST	LEAST				ABOVE ALL

D. Pointing to show emphasis

THIS	THAT	ONE	SOME	FEW
THESE	THOSE	SEVERAL		

E. Cause and effect

BECAUSE	SINCE	SO THAT	AS A RESULT

Appendix I-Q

Main Idea Exercise

(Hunter, **Reading for Main Ideas and Details in Electronics**, p. 4)

The Ball-Peen Hammer

The machinist or tool-makers hammer has a round shaped head on the opposite end of a conventional-shaped head. This tool is commonly called a ball-peen hammer. The flat surface of the ball-peen hammer is used as a conventional hammer and the rounded surface is used for peening metal; for example, peening a rivet. As with all hammers the handle of the ball-peen hammer should be held near the end. The ball-peen hammer should not be used to drive nails.

EXERCISE

Is the following statement the main idea of the paragraph?

The ball-peen hammer should not be used to drive nails?

I hope you didn't say that this was the main idea,because if you did you have mistaken a detail, which is important, for the broader meaning of the paragraph. That is to say this detail is too small, by itself, to be considered the main idea. On the other hand it is possible to make a statement which is too broad. Look at the following:

There are many kinds of hammers.

That can't be the main idea of the paragraph, because this particular one is only dealing with a single kind of hammer. Therefore the statement is too broad, or general, to be thought of as the main idea.

Actually the main idea in this paragraph is contained in the first two sentences. Both sentences have to be used, because there are two names for the hammer and a description of it in the first sentence, but the second sentence says that there is a more common name than the first two. So, you would have to combine these two sentences and put them into your own words in order to come up with a good main idea for the paragraph. Perhaps it should read like this:

> The ball-peen hammer, which is also known as the machinist or tool-makers hammer, has a round-shaped head on the opposite end of a conventional-shaped head.

All the rest of the information in that paragraph adds details to the statement.

In order to really understand a paragraph you also should be able to visualize, or see in your mind, what the author is talking about. Can you picture a ball-peen hammer? It has a conventional (or regular) shaped head on one end, and a round shaped head on the other. Obviously you cannot use this kind of hammer for pulling nails. Can you see it?

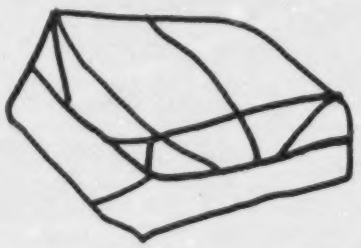
Appendix I-R

Following Directions

(Smith and Eliott, **Reading Activities for Middle and Secondary Schools: A Handbook for Teachers**, p. 93)

MAKE A HAT! (Printer's Hat)

1. Lay out two full sheets of newspaper on your desk, if it is large enough; if not, on the floor or a table.
2. Fold the top left corner down to the center of the sheets.
3. Now fold the top right corner down to the center of the sheets.
4. Fold up the edge of the top sheet of paper to the bottom of the triangle that was formed by your first two folds.
5. Fold the edge a second time so that it looks like a hat band.
6. Turn the papers over.
7. Fold the right edge one-half inch past the centerline. Fold the left side in the same way to the right edge.
8. Fold the lower right and left corners to the bottom of the hat band.
9. Fold the lower flap above the hat band.
10. Fold the top of the flap down and tuck it into the hat band.
11. Fold the peak of the hat down to the bottom of the hat band and tuck it under the band.
12. Open up the hat.
13. Flatten out the top.
14. Tuck the side peak into the band.



Good for you!

Appendix I-S

Reading Diagrams

(Shepherd, Comprehensive High School Reading Methods, p. 114)

Though they are not pictures, diagrams are drawings that explain processes. Students must learn to analyze them in order to understand written materials, and many will need instruction and practice in order to do so.

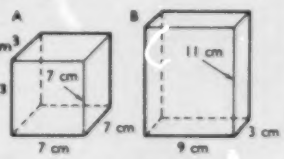
Deceptive Packaging

Consumer Skills

Many shapes and sizes of containers are used to package agricultural products. Some containers are designed to appear to hold more than they actually do. The volume of a container can be approximated by using the formula for volume of a cylinder, cone, prism, or pyramid.

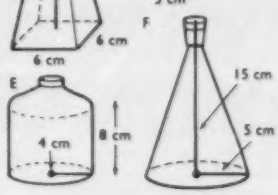
Answer each question about the containers at the right.

1. Which *appears* to hold more, A or B? B
2. What is the volume of container A? 343 cm^3
3. What is the volume of container B? 297 cm^3
4. Which holds more? How much more? A; 46 cm^3

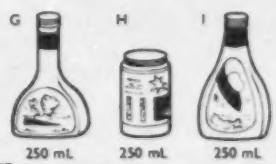


5. Which *appears* to hold more, C or D? C
6. What is the volume of container C? 216 cm^3
7. What is the volume of container D? 225 cm^3
8. Which holds more? How much more? D; 9 cm^3

9. Which *appears* to hold more, E or F? F
10. What is the volume of container E? 401.92 cm^3
11. What is the volume of container F? 392.5 cm^3
12. Which holds more? How much more? E; 9.42 cm^3



13. Which one *appears* to hold the most, G, H, or I? answers vary
14. Which one *appears* to hold the least, G, H, or I? answers vary
15. When comparing several containers of different shapes, how can you tell which one has the largest volume? answers vary Check the label if it has one.



Reprinted by permission from Vannatta and Stoeckinger, *Mathematics: Essentials and Applications* (Columbus: Charles E. Merrill, 1980), p. 325.

Appendix I-T

Reading Charts

(Piercey, **Reading Activities in Content Areas**, pp. 198-201)

SUBJECT AREA

Foods

GRADE LEVEL

7-12

NAME OF ACTIVITY

Breakfast Bowl

OBJECTIVE OF ACTIVITY

To facilitate extracting information from graphs, tables, and charts.

STUDENT PREPARATION

None

TEACHER PREPARATION

Cut the sides from five or six cereal boxes and mount them on a heavy piece of cardboard. Prepare a number of questions that can be answered by reading the information on the boxes. The questions should be written so that one-third are relatively easy, one-third are average, and one-third are difficult or complicated. The easy questions are worth ten points; type them on white cards. Type the average questions worth twenty points on yellow cards, the difficult questions worth thirty points on green cards. (See examples.) Make a pocket for the questions and attach it to the piece of cardboard for storage.

PROCEDURE

The cards are placed in three stacks according to point values. The first player takes the top card from the stack of her choice. She wins the points if she answers correctly within a given time limit. If she answers incorrectly or her time runs out, she receives no points for that round.

The second player proceeds, then others in turn. The used cards are set aside until the game is over. Each player may choose only two cards from the ten-point stack during a game. The first player to accumulate 100 points wins.

Examples of ten-point questions:

- What company manufactures Lucky Charms?
- What is the first, or main, ingredient in Rice Krispies?
- How would you address a letter to Quaker Oats Company?
- One cup of Trix equals how many ounces?

Examples of twenty-point questions:

- Of these three cereals, Rice Krispies, Lucky Charms, and Trix, which one is lowest in fat?
- What is another name for riboflavin? How did you find out?
- How much protein does one-half cup whole milk add to King Vitamin?
- What does USRDA stand for?

Examples of thirty-point questions:

- Why is BHA added to cereal?
- Determine why all three breakfast food companies give information on the amount of essential nutrients needed by a person per day and the amount a particular cereal provides.
- Compare the percentages of USRDAs for persons under four years of age and over four. What conclusions can you draw?
- Check the ingredients on any one of the packages. Why do you think there are ingredients whose names are totally unfamiliar to you?

Lucky Charms ...is a part of this good breakfast

NUTRITION INFORMATION PER SERVING

Serving Size ..... 1 ounce (1 cup)
Servings per Container 9

	1 ounce Lucky Charms	Lucky Charms plus ½ cup Vitamin D milk
Calories	110	190
Protein, grams	2	6
Carbohydrate, grams	24	30
Fat, grams	1	5

PERCENTAGE OF U.S. RECOMMENDED DAILY ALLOWANCES (U.S. RDA)

Protein	4	10
Vitamin A	25	30
Vitamin C	25	25
Thiamin	25	30
Riboflavin	25	35
Niacin	25	25
Calcium	2	15
Iron	25	25
Vitamin D	10	25
Vitamin B_6	25	30
Vitamin B_{12}	25	35

INGREDIENTS

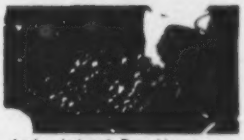
Oat flour, sugar, corn syrup, corn starch, dextrose, wheat starch, salt, gelatin, calcium carbonate, sodium phosphate, sodium ascorbate, natural and artificial flavors, niacin, artificial colors, iron, gum acacia, vitamin A palmitate, pyridoxine (vitamin B_6), riboflavin, thiamin, vitamin B_{12} and vitamin D.

General Mills, Inc.
General Offices
Minneapolis, Minnesota 55440
Made in U.S.A.

NET WT 255 grams

GUARANTEE—If you are not satisfied with the quality and/or performance of the LUCKY CHARMS in this box, send name, address, and reason for dissatisfaction—along with **entire** boxtop and price paid—to:
General Mills, Inc.
Box 200-A
Minneapolis, Minn. 55460
Your purchase price will be returned.

Trix is part of this good breakfast



And so is **toast.** Bread is a source of food energy needed for walking, running, playing, sitting and even resting. Bread also provides several B vitamins, iron and protein. The amount of food energy you need depends on your size, age and how active you are.

Start each day right with a good breakfast. Remember the better you treat your body, the better it'll treat you.

NUTRITION INFORMATION PER SERVING

Serving Size ..... 1 ounce (1 cup)
Servings per Container 8

	1 ounce Trix	Trix plus ½ cup Vitamin D milk
Calories	110	190
Protein, grams	1	5
Carbohydrate, grams	25	31
Fat, grams	1	5

PERCENTAGE OF U.S. RECOMMENDED DAILY ALLOWANCES (U.S. RDA)

Protein	2%	8%
Vitamin A	25%	30%
Vitamin C	25%	25%
Thiamin	25%	30%
Riboflavin	25%	35%
Niacin	25%	25%
Calcium	*	15%
Iron	25%	25%
Vitamin D	10%	25%
Vitamin B_6	25%	30%
Vitamin B_{12}	25%	35%

*Contains less than 2 percent of the U.S. RDA of this nutrient.

INGREDIENTS

Degermed yellow corn meal and oat flour, sugar, corn syrup, wheat starch, salt, monoglycerides, sodium ascorbate, artificial colors, natural and artificial flavors, niacin, iron, gum acacia, calcium carbonate, vitamin A palmitate, pyridoxine (vitamin B_6), riboflavin, thiamin, vitamin B_{12} and vitamin D.

General Mills, Inc.
General Offices
Minneapolis, Minnesota 55440
Made in U.S.A.

NET WT 226 grams

GUARANTEE—If you are not satisfied with the quality and/or performance of the TRIX in this box, send name, address, and reason for dissatisfaction—along with **entire** boxtop and price paid—to:
General Mills, Inc.
Box 200-A
Minneapolis, Minn. 55460
Your purchase price will be returned.

Appendix I-U

Reading Materials Of The Trade

(Alpers and Alfrow, **Vocational Reading Skills Shoptalk: Agriculture**, p. 9)

On the way home from school, Dennis bought a copy of the **Evening Chronicle**. He opened quickly to the Help Wanted section. There were five or six ads for farm equipment mechanics. "Today's my lucky day," he sighed. Then, remembering what Ms. Fitzgerald had told him, Dennis circled the following ad:

Wanted: Farm eqpmt.
mchnc. for expndng.
dlrshp. Exp. pref. but
not nec. Hlpr or aprtce.
O.K. BC/BS, life ins., 2
wks. vac., o.t. avlble.
Exc. oppty. for rlble.
prsn. Sal. neg. Ref. req.
Write Eve. Chr. Box 25.

Most of the words in this ad are abbreviated, or shortened. Can you think of a reason why?

On the following lines, rewrite the ad, using complete words instead of the abbreviations.

_____

_____

_____

_____

_____

_____

QUESTIONS

1. Can you think of three reasons why the above ad was appealing to Dennis?

a. _____

b. _____

c. _____

Appendix I-V

Reading Technical Material

(Alpers and Mitchell, **Vocational Reading Skills**
Shoptalk: Electricity, pp. 80-85)

INFORMATION PLEASE

In working on the LaPointes' fixture, Dennis had to look up some information. The following pages are the ones he used. The first page is part of the alphabetical **index** from the National Electrical Code. On the second page is the **article** to which the index directed him. The third page is the **labor calculator.**

A. To which article and section would the alphabetical index refer you for information on each of the following subjects? Circle the correct letter.

1. lampholders for outdoor lighting
   a. 422-15 b. 410-8 c. 225-25 d. 225-52

2. grounding of lightning arresters
   a. 280-B b. 250-M c. 230-82 d. 205-M

3. lighting fixtures for swimming pools
   a. 608-20 b. 520 c. 410-D d. 680-20

4. lengths of rigid metal conduit
   a. 346-15(a) b. 364-15(a) c. 424-34 d. 346-51(a)

5. fixture supports
   a. 410-7 b. 401-D c. 410-D d. 680-20

B. Based on page 70-249 of the National Electrical Code, answer the following questions:

1. What is the maximum weight of a lighting fixture that may be supported by the screw shell of a lampholder?
   a. 60 lbs. b. 6 lbs. c. .6 lbs. d. 5.2 lbs.

2. Under which section of article 410 could you find more information on exposed conductive parts of lighting fixtures?
   a. 410-18(b) b. 410-18(a) c. 410-17 d. 410-18(a) and (b)

3. Let's assume that the fixture Dennis installed weighed 5.2 lbs. To which section would he refer for more information on the support of the fixture in relation to the outlet box?
   a. 364-11 b. 410-16(a) c. 370-13 d. 410-18(a)

Lamp(s), etc. (*Continued*)
Motion-Picture Studios, in, 530-16, 530-17
Show-Windows, 400-11
Theaters
Border and Proscenium, 520-44
Dressing Rooms, 520-72
Festoons, 520-65
Footlights, 520-43
Scene Docks, in, 520-47
Stage, Arc, 520-61
Switchboards, Pilot Lights, 520-53
Wattage Marking, Flush and Recessed Fixtures, 410-70

Lampholders
Branch Circuits Supplying
15-20 amps, Medium-Base, 210-23(a)
30-50 amps, Heavy-Duty, 210-23(b), (c), (d)
Circuits Less Than 50V, for, 720-5
Construction, 410-J
Damp or Wet Locations, 410-4, 410-49
Double-Pole Switched, 410-48
Heavy-Duty,
Defined, 210-21(a)
Unit Loads, 220-2(c)
Infrared Lamps, 422-15
Outdoor Lighting, 225-25
Pendant
Not in Clothes Closets, 410-8
Not in Theater Dressing Rooms, 520-71
Screw-Shell Types for Lamps only, 410-47
Signs and Outline Lighting, 600-22
Unswitched Over Highly Combustible Material, 410-6

Laundry Outlets, Dwellings, 210-25(b), 220-3(c)

Length(s)
Busways used as Branch Circuits, 364-13
Free Conductors at Outlets and Switches, 300-14, 424-43, 426-25
Nonmetallic Flexible Tubing with Open Wiring, 320-10
Nonmetallic Rigid Conduit, 347-17(a), (b)
Pull and Junction Boxes, 370-18(a) (1)
Rigid Metal Conduit, 346-15(a)
Space Heating Cable Nonheating Leads, 424-34
Taps,
Cooking Appliances, 210-19(b), Exc. 2
Feeders, 10-ft. Rule, 240-21, Exc. 2; 25-ft. Rule, 240-21, Exc. 3 and 8
Individual Lampholders or Fixtures, 210-19(c), Exc. 1(a)
Individual Outlets, 210-19(c), Exc. 2(b)
Motor Feeders, 25-ft. Rule, 430-28

Light(s) (see also Lamps and Lighting)
Border, Cables for, Theaters, 520-44(b)
From Railway Conductors, 110-19
Scenery, Theaters, Halls, 520-63

Lig
Br Circuit(s), Calculation of Load, 220-2(a)
Emergency, Art. 700
Feeders, Calculation of Load, 220-10(a), 220-30
Fixtures (see Lighting Fixtures)
Outlet, Definition, Art. 100
Outlets required, 210-26

Lighting Fixtures, Art. 410 (see also Hazardous Locations)
Autotransformers, Ballasts Supplying *Fluorescent* Fixtures, 410-78
Supplying Circuits, 210-9

Lighting Fixtures (*Continued*)
Auxiliary Equipment, 410-78
Boxes, Canopies, Pans, 410-C
Branch Circuits
Sizes, 210-22, 210-23
Unit Loads, 220-2(a), (b), (c)
Voltages, 210-6, 410-73
Clothes Closets, 410-8
Combustible Material, Near, 410-5
Connection
Fluorescent, 410-14
General, 410-30
Construction of, 410-N, 410-P
Corrosive (see Damp, etc.)
Coves, Adequate Space, 410-9
Damp, Wet, or Corrosive Locations, 410-4, 410-49
Ducts or Hoods, in, 410-4(c)
Electric Discharge Lighting
Systems 1000 V or less, 410-Q;
Systems over 1000 V, 410-R
Voltages-Dwelling Occupancies, 410-75
Fluorescent, 410-Q, 410-R
Autotransformers in Ballasts, 410-78
Ballast Protection, 410-73(e)
Connection, 410-14
Flush, 410-N
Grounding, 410-E
Live Parts, 410-3
Location, 410-8
Motion-Picture Studios, Art. 530
Outdoor (see Damp, etc.)
Outlets required, 210-26
Overcurrent Protection, Wires and Cords, 240-4
Polarization, 410-32
Raceways, 410-31
Recessed, 410-N
Show Windows, 410-7
Supports, 410-D
Swimming Pools, 680-20
Theaters, Art. 520
Wet (see Damp, etc.)
Wiring, 410-F

Lightning Arresters (see also Lightning Protection and Rods), Art. 280
Antenna Discharge Systems, 810-20(a), (b)
Connections at Services, 230-82
Grounding, 250-M
Industrial Stations, 280-B
Radio and Television Equipment
Receiving Stations (Antenna Discharge Units), 810-20(a), (b)
Transmitting Stations, 810-57
Services Over 600 Volts, 230-209

Lightning Protection (see also Lightning Arresters and Rods)
Communication Circuits, 800-12
Hazardous Locations, 501-16(c), 502-3

Lightning Rods (see also Lightning Arresters and Protection)
As a Ground, 250-86
Spacing from Conductor Enclosures and Equipment, 250-46

Lint, Flyings (see Hazardous Locations)

Liquidtight Flexible Metal Conduit, Art. 351

Listed, See Definition, Art. 100

Live Parts (see also Enclosures, Guarding)
Appliances, Disconnecting Means, 422-D
Capacitors, Guarding, 460-2
Generators, Protection, 445-6
Guarding, General, 110-17

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rating than the branch circuit but not less than 125 percent of the fixture full-load current.

Fixtures shall be permitted to be connected in accordance with Section 364-11.

D. Fixture Supports

410-15. Supports—General. Fixtures, lampholders, rosettes, and receptacles shall be securely supported. A fixture that weighs more than 6 pounds or exceeds 16 inches in any dimension shall not be supported by the screw-shell of a lampholder.

410-16. Means of Support.

(a) Outlet Boxes. Where the outlet box or fitting will provide adequate support, a fixture shall be attached thereto or be supported as required by Section 370-13 for boxes. A fixture that weighs more than 50 pounds shall be supported independently of the outlet box.

(b) Suspended Ceilings. Framing members of suspended ceiling systems used to support fixtures shall be securely fastened to each other and shall be securely attached to the building structure at appropriate intervals. Fixtures so supported shall be securely fastened to the ceiling framing member.

(c) Raceway Fittings. Raceway fittings used to support lighting fixtures shall be approved for the purpose.

E. Grounding

410-17. General. Fixtures and lighting equipment shall be grounded as provided in Part E of this Article.

410-18. Exposed Fixture Parts.

(a) The exposed conductive parts of lighting fixtures and equipment directly wired or attached to outlets supplied by a wiring method which provides an equipment ground shall be grounded.

(b) Fixtures directly wired or attached to outlets supplied by a wiring method which does not provide a ready means for grounding shall be made of insulating material and shall have no exposed conductive parts.

Exception: Fixtures mounted on electrically nonconductive ceilings or walls where located not less than 8 feet vertically or 5 feet horizontally from grounded surfaces.

410-19. Equipment Over 150 Volts to Ground.

(a) Metal fixtures, transformers, and transformer enclosures on circuits operating at over 150 volts to ground shall be grounded.

(b) Other exposed metal parts shall be grounded or insulated from ground and other conducting surfaces and inaccessible to unqualified persons.

Exception: Lamp tie wires, mounting screws, clips, and decorative bands on glass lamps spaced not less than 1½ inches from lamp terminals shall not be required to be grounded.

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Labor Calculator

The labor calculator is easy to use, and is appropriate for both estimates and bills. To prepare an estimate for a certain job, you have to know what to charge for labor. In the electrical trade the labor charge is usually estimated by experience. Let's say you've done a job several times, and it has taken you an average of 3.5 hours to complete. Your shop charges $11.00 per hour for labor. You look straight across from 3.5 to the column under $11.00 per hour. The figure of $38.50 is the *estimated* labor charge for the job. If the *actual* job time is *not* greater than your estimated time, this estimated labor charge becomes the actual labor charge that appears on the bill.

Time	$10.00 per hr.	$10.50 per hr.	$11.00 per hr.	$12.00 per hr.
.1	$1.00	$1.05	$1.10	$1.20
.2	2.00	2.10	2.20	2.40
.3	3.00	3.15	3.30	3.60
.4	4.00	4.20	4.40	4.80
.5	5.00	5.25	5.50	6.00
.6	6.00	6.30	6.60	7.20
.7	7.00	7.35	7.70	8.40
.8	8.00	8.40	8.80	9.60
.9	9.00	9.45	9.90	10.80
1.0	10.00	10.50	11.00	12.00
1.1	11.00	11.55	12.10	13.20
1.2	12.00	12.60	13.20	14.40
1.3	13.00	13.65	14.30	15.60
1.4	14.00	14.70	15.40	16.80
1.5	15.00	15.75	16.50	18.00
1.6	16.00	16.80	17.60	19.20
1.7	17.00	17.85	18.70	20.40
1.8	18.00	18.90	19.80	21.60
1.9	19.00	19.95	20.90	22.80
2.0	20.00	21.00	22.00	24.00
2.1	21.00	22.05	23.10	25.20
2.2	22.00	23.10	24.20	26.40
2.3	23.00	24.15	25.30	27.60
2.4	24.00	25.20	26.40	28.80
2.5	25.00	26.25	27.50	30.00
2.6	26.00	27.30	28.60	31.20
2.7	27.00	28.35	29.70	32.40
2.8	28.00	29.40	30.80	33.60
2.9	29.00	30.45	31.90	34.80
3.0	30.00	31.50	33.00	36.00
3.1	31.00	32.55	34.10	37.20
3.2	32.00	33.60	35.20	38.40
3.3	33.00	34.65	36.30	39.60
3.4	34.00	35.70	37.40	40.80
3.5	35.00	36.75	38.50	42.00
3.6	36.00	37.80	39.60	43.20
3.7	37.00	38.85	40.70	44.40
3.8	38.00	39.90	41.80	45.60
3.9	39.00	40.95	42.90	46.80
4.0	40.00	42.00	44.00	48.00
4.1	41.00	43.05	45.10	49.20
4.2	42.00	44.10	46.20	50.40
4.3	43.00	45.15	47.30	51.60
4.4	44.00	46.20	48.40	52.60
4.5	45.00	47.25	49.50	54.00

On the next page is the bill that Dennis made out to Mr. LaPointe. Look it over carefully.

Dennis put the total cost of materials at the bottom.

The installation of the fixture does not exceed the estimated time of .6 hours. Travel time adds another .2 hours. The total time comes to .8 hours.

According to the labor calculator, .8 hours @ $10.50 per hour comes to $8.40 in labor. This figure is listed at the bottom of the bill as **total labor.**

Iowa has a 3 percent sales tax on materials. So on $26.40 in materials, the tax is $.79.

The total bill, therefore, is the sum of total materials, total labor, and tax.

Now It's Your Turn

Following Dennis's bill is a blank bill. Using the following information, make a bill out, just as if you'd done the job yourself. Use a piece of scrap paper to help you get organized.

A customer's clothes dryer needs repair. You go to the home and diagnose the problem. You recommend a wiring job, present an estimate, and complete the job. You use the following materials:

1 2-pole, 30 amp. circuit breaker @ $9.50
1 surface dryer receptacle @ $4.30
1 3/4" offset nipple @ $.85
2 3/4" lock nuts @ $.11
39', #8/3 NM cable @ $.30/ft.
22 NM staples @ 2/$.01

You do not exceed the estimated installation time of 2.0 hours. Travel adds another .5 hours.

The labor charge is $10.50 per hour.

Add a 3 percent sales tax on materials.

Styles Electric, Inc.
Second Street
Ames, Iowa 50010
Phone 617-7357

JOB WORK ORDER

No. 19638

DATE OF ORDER: 7/27/80

CUSTOMER'S ORDER NO.	PHONE	MECHANIC	HELPER	STARTING DATE
2431	862-1493		Watkins	7/27/80

BILL TO: Mr. C. LaPointe

ORDER TAKEN BY: Watkins

ADDRESS: 54 Franklin St.

CITY: Ames, Iowa 50010

☒ DAY WORK
☐ CONTRACT
☐ EXTRA

JOB NAME AND LOCATION: fixture installation - LaPointe residence

JOB PHONE:

DESCRIPTION OF WORK

Materials:

153 one Sure-Switch Fixture
Model DR679 — 26.40

Labor:

installation — 6.30
travel — 2.10

TOTAL MATERIALS	26	40
TOTAL LABOR	8	40
TAX		79
TOTAL AMOUNT	$ 35	59

DATE COMPLETED: 7/27/80
WORK ORDERED BY: C. LaPointe

☐ No one home
☐ Total amount due for above work; or
☒ Total billing to be mailed after completion of work

Signature _____

I hereby acknowledge the satisfactory completion of the above described work.

167

Styles Electric, Inc.
Second Street
Ames, Iowa 50010
Phone 617-7357

JOB WORK ORDER

No. 19638

DATE OF ORDER

CUSTOMER'S ORDER NO.	PHONE	MECHANIC	HELPER	STARTING DATE

BILL TO

ORDER TAKEN BY

ADDRESS

☐ DAY WORK
☐ CONTRACT
☐ EXTRA

CITY

JOB NAME AND LOCATION

JOB PHONE

DESCRIPTION OF WORK

TOTAL MATERIALS		
TOTAL LABOR		
TAX		
TOTAL AMOUNT	$	

DATE COMPLETED
WORK ORDERED BY

☐ No one home
☐ Total amount due for above work; or
☐ Total billing to be mailed after completion of work

Signature _____

I hereby acknowledge the satisfactory completion of the above described work.

APPENDIX II: REFERENCE - RESOURCE LIST

Allington, Richard, and Strange, Michael. **Learning Through Reading in the Content Areas.** Lexington, Mass: D. C. Heath and Co., 1980.

Presents theoretical basis and suggests procedures for improving students' ability to use texts. Strong in explaining concept development. Extensive guide for group informal textbook tests.

Alpers, Byron J., and Mitchell, Alfrow L. **Vocational Reading Skills Shoptalk: Agriculture.** Boston: Allyn and Bacon, Inc., 1978. VT

_____ **Vocational Reading Skills Shoptalk: The Automobile.** Boston: Allyn and Bacon, Inc., 1978. VT

_____ **Vocational Reading Skills Shoptalk: Carpentry.** Boston: Allyn and Bacon, Inc., 1978. VT

_____ **Vocational Reading Skills Shoptalk: Electricity.** Boston: Allyn and Bacon, Inc., 1978. VT

_____ **Vocational Reading Skills Shoptalk: Electronics.** Boston: Allyn and Bacon, Inc., 1978. VT

_____ **Vocational Reading Skills Shoptalk: Metal and Machines.** Boston: Allyn and Bacon, Inc., 1978. VT

_____ **Vocational Reading Skills Shoptalk: Reading.** Boston: Allyn and Bacon, Inc., 1978. (Teachers Edition also.) VT

Archer, Fred C.; Brecker, Raymond F.; Frake, John C.; and Stewart, Jeffrey R. **General Office Practice.** New York: McGraw-Hill Book Co., 1968. VT

Aulls, Mark W. **Development and Remedial Reading in the Middle Grades.** Boston: Allyn and Bacon, Inc., 1978.

Baker, Katherine R., and Fane, Xenia F. **Understanding and Guiding Young Children.** Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1975. (Teacher's Edition also.) VT

*Items marked VT are vocational texts.

Bamman, H. A.; Hogan, U.; and Greene, C. E. **Reading Instruction in the Secondary Schools.** New York: David McKay Co., Inc., 1967.

A guide to assist in the teaching of reading and improvement of reading skills for specific content areas.

Blockhus, W., and Toren, C. **Student Activity Guide I - General Business for Everyday Living.** New York: McGraw-Hill Book Co., 1972. VT

Student manual complete with lessons and activities.

Bromley, W. S. **Pulpwood Production.** Illinois: Interstate Printers and Publishers, Inc., 1976. VT

Part I, Unit B and Part III, Unit I are used for DRA and Study Guide.

Brown, Walter C.; Wagner, Willis H.; Boyd, Gardner T.; and Gerrish, Howard H. **Modern General Shop.** Illinois: Goodheart Wilcox Co., Inc., 1978. VT

Drafting, Unit 4 and Electricity, Unit 1 are used for the DRA and Study Guide.

Bryant, Linda S. **Modifying Instruction for Various Reading Abilities.** Winthrop College, class material, 1981.

Detailed descriptions of the language experience approach, the Directed Activity for Reading and Thinking, rewriting content material to lower the difficulty, and using non-print media.

Burmeister, Lou E. **Reading Strategies for Middle and Secondary School Teachers.** Reading, Mass: Addison-Wesley Publishing Co., 1978.

This text shows many examples of teaching strategies for developing content area vocabulary. These activities can readily be adapted for vocational subjects.

Butz, Roy, and Gunabalan, Lynn. **VRP: Reading Power in the Content Areas-Training Manual.** 1979.

A compilation of extremely useful information and teaching suggestions for vocational subjects. Clear precise directions for implementing the suggestions. Note especially treatment of Sight Vocabulary Test, Preparation of Key Word Glossary, and Steps for Classroom Implementation of Reading Improvement activities.

Caldwell, Esther, and Hegner, Barbara. **Health Assistant.** New York: Delmar Publishers, 1980. VT

Units 2 and 4 are used for DRA and Study Guide.

Carroll, John B.; Davis, P.; and Richman, B. **American Heritage Word Frequency Book.** Boston: Houghton-Mifflin Co., 1971.

Charlotte-Mecklenburg Schools. **ESAA-TRICA.** Course Syllabus for Teaching Reading in Content Areas.

Materials used to train content teachers in the principles found in Herber's **Teaching Reading in Content Areas.**

Dalton, John W. **The Professional Cosmetologist.** St. Paul: West Publishing Co., 1979. (Teacher's Edition also.) VT

Dechant, E. V. **Improving the Teaching of Reading.** Englewood Cliffs: Prentice Hall, Inc., 1974.

An in-depth resource that treats reading as a science and refers to the development of skills, the inherent qualities of the reader, readiness, the improvement of reading skills, and diagnostic methods.

Dishner, Ernest K.; Bean, Thomas W.; and Readence, John E. **Reading in the Content Areas: Improving Classroom Instruction.** Dubuque, Iowa: Kenall/Hunt Publishing Co., 1981.

A collection of articles by many authors-some original, some from journals. Particularly interesting are Smith, "The Role of Prediction in Reading"; Herber and Nelson, "Questioning Is Not the Answer"; and Thomas, "The Directed Inquiry Activity."

Ekwall, E. E. **Locating and Correcting Reading Difficulties.** Columbus, Ohio: Charles E. Merrill Publishing Co., 1970.

Diagnostic and prescriptive manual which offers recommendations and learning activities.

Estes, Thomas, and Vaughan, Joseph L. Jr. **Reading and Learning in the Content Classroom.** Boston: Allyn and Bacon, Inc., 1978.

Contains detailed guide for constructing study guides. Steps for prereading are also useful.

Forgan, Harry W., and Mangrum, Charles T., III. **Teaching Content Area Reading Skills.** Columbus, Ohio: Charles E. Merrill Publishing Co., 1976.

Modular program designed to help content area teachers develop 10 basic competencies needed to teach reading (Pre-tests, objectives, activities and post-tests).

Grubb, Francine. **Games for Learning.** New Brunswick N. J.: New Jersey Department of Education, Vocational-Technical Curriculum Laboratory, 1978.

Hafner, L. E. **Developmental Reading in Middle and Secondary Schools: Foundations, Strategies and Skills for Teaching.** New York: MacMillan Publishing Co., Inc., 1977.

Text geared to aid teachers and reading specialists improve reading skills. Deals with the importance of reading, how to develop skills, and how to teach skills in content areas.

Harris, A. J., and Sipay, E. R. **How to Increase Reading Ability.** New York: David McKay Co., Inc., 1978.

Text used to teach college-level or graduate students reading diagnosis and remediation. Deals with developmental reading program;, evaluation and diagnosis; and developmental and remedial teaching.

Herber, Harold L. **Teaching Reading in Content Areas.** New Jersey: Prentice-Hall, Inc., 1978.

Focuses on functional teaching of reading and simultaneous teaching of reading and course content with emphasis on teaching strategies. Many sample study guides included.

Hunter, Charles F. **Reading for Main Ideas and Details in Electronics.** San Jose City Coll., Calif.: San Jose Community College District, 1981. (ERIC Document Reproduction Service No. ED 206 830). VT

Johns, Jerry L. **Reading Resource Book.** Dekalb, Illinois: By the author, 1982.

An extensive collection of resources; some by the author. Detailed table of contents makes it easy to locate material wanted. Good list of principles for teaching content vocabulary.

Johnson, Dale D., and Pearson, P. David. **Teaching Reading Vocabulary.** New York: Holt, Rhinehart and Winston, 1978.

A well organized, comprehensive treatment of ways to teach vocabulary. Suggestions in sections on dictionary and thesaurus could be adapted for specialized vocational dictionaries and references.

Johnson, Harold V. **General Industrial Machine Shop.** Illinois: Charles A. Bennett Co., Inc., 1970. VT

Units 4 and 13 are used for DRA and Study Guide.

Lamberg, W. J., and Lamb, C. **Reading Instruction in the Content Areas.** Chicago: Rand McNally College Publishing Co., 1980.

Book designed for middle and secondary teachers-carries them from assessment of skills to development of reading lessons with emphasis on technical reading skills.

Lee, Howard D. "Dealing with Reading in Industrial Arts." **Journal of Reading** 24 (1981): 663-666.

Howard D. Lee, who knows industrial education, gives suggestions and sources of help. He deals particularly with assessing student ability and the difficulty of materials, using reading guides, and dealing with vocabulary.

Mankoski, Linda C., and Katzenbach, Marie H. **Homemaking, A Reading and Language Workbook.** New Brunswick, N. J.: New Jersey Department of Education, Vocational-Technical Curriculum Laboratory, 1978.

This book gives the middle school, prevocational student practice using the vocabulary essential for basic cooking, home care, and basic sewing. Short stories reinforce the content taught in those areas. They are followed by activities which provide practice in reading comprehension and written communication. It was originally prepared for deaf students, but would be usful with any prevocational students in need of reading and language improvement.

McDermott, Irene E., and Nichols, Florence W. **Homemaking For Teenagers.** Illinois: Charles A. Bennett Co., 1970. VT

Chapters 5 and 8 are used for DRA and Study Guide.

McFarland, Marilyn K., and Knoll, Marialyce. **Exploring Careers in Child Care.** Bloomington, Ill.: McKnight Publishing Co., 1974. VT

McFarland, Marilyn K.; Ramstetter, Vera; and Knoll, Marialyce. **Exploring Careers in Hospitality and Food Service.** Bloomington, Ill.: McKnight Publishing Co., 1975. VT

Nielson, Duane M., and Hjelm, Howard F. **Reading and Career Education.** Newark, Del.: International Reading Association, 1975.

Niles, O. S. "Comprehension Skills." **Reading Teacher** 17 (1963): 2-7.

Presentation and support of a few basic principles for fostering comprehension growth. The ideas presented here have received such wide acceptance that they are found in many current words. Often the writers seem unaware of the source of their learning.

Pasewark, William R., and Loiverio, Mary Ellen. **Clerical Office Procedures.** Cincinnati: South-Western Publishing Co., 1978. VT

Sections from Unit 6 and 16 are used for DRA and Study Guide.

Pearson, P. David, and Johnson, Dale D. **Teaching Reading Comprehension.** New York: Holt, Rhinehart and Winston, 1978.

Piercey, Dorothy. **Reading Activities in Content Areas.** Boston: Allyn and Bacon, Inc., 1976.

Chapter on industrial and vocational arts gives exciting suggestions for teaching: woodworking-decisionmaking, shop terms, following directions, known words with new technical meaning, auto mechanics-known words with new technical meaning, recognition and verbalization of problems, hypothesizing.

Readence, John E.; Bean, Thomas W.; and Baldwin, R. Scott. **Content Area Reading: An Integrated Approach.** Dubuque, Iowa: Kendall/Hunt Publishing Co., 1981.

Contains excellent treatment of "Introducing the Text" and "Text Evaluation Checklist." Use of graphic overview is illustrated at the beginning of each chapter. Good directions for constructing content reading inventory (group informal textbook test).

Reading-Communications: Air-Conditioning and Refrigeration. Piedmont Technical College, Greenwood, SC. Course outline.

More than forty learning activities which deal with skills such as vocabulary, using the context, skimming and scanning, and reading comprehension. Approximately fifteen subtopics in the field of refrigeration are the themes for from one to fifteen exercises applying reading skills in that area. Pre - and post tests for vocabulary and comprehension are included. This could serve as a model for constructing similar material for other areas.

Rhodes, L. and G. **Teaching with Newspapers: The Living Curriculum.** Blomingdale, Ind.: Phi Delta Kappa Educational Foundation, 1980.

Refers to the newspaper for the teaching of reading because of its availability to students. Includes activities and rationale for use of the newspaper to teach reading.

Richert, G. Henry; Meyer, Warren G.; Haines, Peter G.; and Harris, E. Edward. **Retailing Principles and Practices.** New York: McGraw-Hill, 1974. VT

Unit 1 and Parts 2 and 3 are used for DRA and Study Guide.

Sasse, Connie R. **Discovering Food: Student Guide.** Peoria, Ill.: Chas. A. Bennett Co., Inc. 1978. VT

Shepherd, David L. **Comprehensive High School Reading Methods.** Columbus, Ohio: Charles E. Merrill Publishing Co., 1982.

Contains particularly useful chapter "Applying Reading Skills to Business Education, Industrial Arts, and Home Economics." The discussion of adjusting materials to the students includes a guide for rewriting. Extensive guidance of preparing a group inventory for a text can be adapted to texts of any subject.

Smith, C. B., and Elliott, P. G. **Reading Activities for Middle and Secondary Schools: A Handbook for Teachers.** New York: Holt, Rinehart and Winston, 1979.

The handbook is long on activities and very short on theory. A chart in the back labeled Activities for Slow Readers identifies activities for every skill which are appropriate for vocational classes. Three topics that seem particularly promising are the specific directions for constructing crossword puzzles for content words, the activity for teaching the use of context to determine word meaning, and the examples of ways to improve the students' ability to read diagrams.

Smith, Susan J., Editor. **Teaching Reading in South Carolina Secondary Schools.** Columbia, SC: South Carolina Department of Education.

A guide for planning, implementing and evaluating reading instruction at the secondary level.

Spence, William P. **Basic Industrial Drafting.** Peoria, Ill.: Chas. A. Bennett Co., Inc., 1974. VT

Strang, Ruth; McCullough, Constance M.; and Traxler, Arthur E. **The Improvement of Reading.** 4th ed. New York: McGraw-Hill, 1967.

A tried and true comprehensive text on teaching reading. The senior author started in the field of home economics and later became an expert in child development, guidance, and reading.

Teacher Guide: Basic Skills and the World of Work. Copyright is claimed until January 1, 1987.

Textile Processing, Vol. II. Columbia, SC: South Carolina Department of Education, 1977. VT

Sections from Chapter 1 and Chapter 9 are used for DRA and Study Guide.

Winburn, John. **Dictionary of Agricutural and Allied Terminology.** East Lansing, Mich.: Michigan State University Press, 1962. VT

Wingate, John W., and Nolan, Carroll A. **Fundamentals of Selling.** Cincinatti: South-Western Publishing Co., 1969. VT

Wolfe, K. C. **Cooking for the Professional Chef.** New York: Delmar Publishers, Inc., 1982. VT

A complete manual with learning exercises used either for food service students or the foods and nutrition unit. Covers basic cooking techniques for all food types.

APPENDIX III: ANSWERS TO SELF-CHECKS

Answers to Self-Check on Cloze Procedure

1. T 2. F 3. F 4. T 5. T 6. F 7. F

Answers to Self-Check on Students' Test Grades and Readability Grades

1. Instructional level is often one grade lower than standardized test score.

2. Independent level is often two grades lower than standardized test score.

3-4. Readability measures are based on difficulty of words and difficulty of sentences.

5. Publishers often describe texts as being easier than teachers' opinions of how difficult the text is.

6. The subject matter sometimes makes it almost impossible to control word difficulty.

Answers to Self-Check on Group Informal Textbook Tests

1. B. The teacher's first task is to analyze the skills needed in content.

2. A. The most valuable information is knowing which skills are needed by each pupil.

3. D. Results of the group informal textbook test are used for planning ways to assure successful learning.

Answers to Self-Check on Adjustments Which Enable Students to Cope with Content Reading

1. The instructor can help students by requiring extensive prereading activities such as building background, key concepts and key vocabulary, and formulating purposes for reading.

2. Ways to make content reading easy enough for very poor readers are rewriting at an easier level, using language experience techniques to have students write their own text, and providing tapes to be used with the regular text.

Answers to Self-Check for Overview of Vocabulary Study

1. D In this book vocabulary includes word meaning and word identification.

2. A

3. A

4. N Thesauruses were not mentioned. Like the dictionary, a specialized thesaurus would be more useful than a general one.

5. A

6. N It is not necessary to teach all words "important to a given topic." They may be important but not crucial. If sufficient carefully selected words are taught, the student can infer the meaning of others or comprehend without the meaning of some.

7. D Nobody can be sure of the meaning of a word out of context.

Answers to Self-Check on Word Meaning

1. Students may have neither the concept nor the word to label it.

2. They may have the word and a general concept the word represents but not have the specialized meaning used in the vocational field.

3. They may have the concept but have no word to label the meaning or an imprecise label, e.g., that <u>do hickey</u>.

4. Dale's Cone of Experience has concrete experience at the bottom. If the student has little experience with the concept being taught, experience must be provided. That usually is time consuming.

5. Symbols, at the top of the Cone, are abstract. Words are symbols and represent an efficient means of communication <u>IF</u> the symbols have been built on a collection of related experiences.

6. By context

7. Morpheme is a name given to the parts of words that represent meanings. Morphemic analysis breaks a word into meaningful parts.

8-10. Techniques that aid in determining meaning of an unfamiliar word are context, morphemic analysis, and dictionary.

Answers to Self-Check for Word Identification Techniques

(1) high frequency (2) technical or specialized (3) know (4) contextual (5) Phonics (6) alphabetical order (7) pronunciation keys or pronunciation guides (8) oral or speaking or listening.

Answers to Self-Check on Comprehension

1-3. In this discussion the three most important comprehension skills students should be taught are to set purposes for reading, to relate the content to what the reader already knows, and to discover the writer's thought pattern (organization). The order in which these skills are listed does not matter. The wording may vary.

4. C In most classrooms wait time after a question has been asked should be longer.

5. E All the combinations of question and answer can be useful in developing comprehension.

6. A To maintain an atmosphere of spontaniety, teachers should mostly use questions formulated during class discussion. Questions should be carefully planned in view of the content goals and student characteristics. This does not prohibit spontaneous inquiry.

7. B Reciprocal questioning describes the turn and turn-about quality of this process.

8-9. "These things are wrong with my bookcase," appears to signal a simple list.

"As Ruth entered, she picked up her apron; then she . . .," seems to show time order.

10. Writing in telegraph style helps to state the main ideas.

Answers to Self-Check on What a DRA Is

1. The DRA is a 5-step plan designed to aid the teacher in developing a reading lesson from a content area textbook.

2. The five steps of the DRA are preparation, silent reading, developing comprehension, rereading, and follow-up.

3. Before beginning the DRA , the teacher must analyze the content of the material to be studied to decide what key concepts, generalizations, and new vocabulary the students are to gain from the lesson.

Answers to Self-Check on Preparation in a DRA

1. Background information is necessary for students to be able to successfully comprehend the lesson and it also provides motivation for reading.

2. Vocabulary words should be chosen according to their importance to the lesson - any words which can be figured out from the text should be omitted.

3. Purposes must be set so students will know why they are reading the lesson and what they are to gain from it. When setting purposes, the instructor must consider the students' background and the desired understanding of the material.

4. Previewing allows students to get a feel for the material to be read. They become aware of the organization of the material and are given instructions as to how the material should be read for best results.

5. Instructors must have enthusiasm and a positive attitude toward the material if they are to prepare and motivate the students properly.

Answers to Self-Check on Silent Reading in a DRA

1. The instructor can provide for lower reading levels by taping the selection, rewriting it, and by having able readers read to the poorer readers.

2. It is helpful to begin a reading assignment in class because it allows the instructor to give individual help to those who need it and it encourages students to complete their assignments.

Answers to Self-Check on Developing Comprehension in a DRA

1. Discussing the material minimizes forgetting by allowing students to fit new material into their existing framework.

2. During the discussion phase, ideas are discussed, facts are stated, conclusions are drawn, and the importance of the material is evaluated.

3. The question and answer method can be used to stimulate the discussion.

Answers to Self-Check on Rereading in a DRA

1. Rereadirg may be done to further clarify information just discussed or to locate difficult vocabulary or statements of fact.

2. Rereading may be silent, oral, done for the entire selection or done for just certain parts.

Answers to Self-Check on Follow-up in a DRA

1. Follow-up activities are done to reinforce and extend skills and to give the students the opportunity to apply what has been learned to practical areas.

2. Follow-up activities may be in the form of gathering more information or actual problem solving.

Answers to Self-Check on Why the DRA Should Be Used

1. Content area instructors need to be concerned with teaching reading because reading is a basic and important part of every content area and students' success depends on how competent they are in the language of the subject being taught.

2. The DRA provides an outline for content area instructors to use when developing a reading lesson from a textbook.

Answers to Self-Check on Steps for Constructing a Study Guide

The five steps involved in constructing a study guide are:

1. Instructors must analyze the material for content and decide what information needs to be emphasized;
2. Analyze the material for process;
3. Decide how much assistance is needed;
4. Construct the guide; and
5. Use the guide within a well-planned lesson.

Answers to Self-Check on Qualities and Use of Study Guides

1. The study guide must reflect both the content and the process of the material to be studied.

2. Study guides should be used with lessons that need careful reading.

3. It is helpful to work on study guides in class because students may help each other and the instructor is available to answer questions.

Answers to Self-Check on SQ3R

1. SQ3R means survey, question, read, recite, and review.

2. This formula is designed to be used by students as a way of working through a reading assignment independently.

3. With lower reading levels, the instructor can guide the students through the formula in small groups or as an entire class.